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PROGRESSIVE MEDICINE

A QUARTERLY DIGEST
OF
ADVANCES, DISCOVERIES AND IMPROVEMENTS IN THE MEDICAL AND SURGICAL SCIENCES

EDITED BY

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DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS, AND BLOODVESSELS—DERMATOLOGY AND SYPHILIS—OBSTETRICS—DISEASES OF THE NERVOUS SYSTEM.

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SEPTEMBER, 1908.

DISEASES OF THE THORAX AND ITS VISCERA, INCLUDING THE HEART, LUNGS, AND BLOODVESSELS.

By WILLIAM EWART, M.D., F.R.C.P.

TUBERCULOSIS.

The past year has perhaps been less eventful than some of the recent years in great pronouncements and in striking innovations. But it has been one of conspicuous progress in the elaboration of our practical methods and of our theoretical studies, eminently a year of development, not only in every aspect of the actual work of prophylaxis and of treatment, but also in the maturing of the ideas which are gradually shaping that work into greater efficiency.

In some directions the course that we ought to follow has been obvious. There are certain great principles which need no further elucidation. They only require to be applied. But it is in their application that immense difficulties have to be contended with. These self-evident principles are those of public hygiene. There can be no doubt that immense advantage would follow the adoption of such measures as Notification, Inspection, Segregation, and Compulsory Disinfection. The obstacles in the way are financial, social, and individual; the individual obstacle being almost the greatest of all, as it involves not only economical and financial consideration, but also that of the personal health reputation of the subject, with all the consequences attaching to it. We are still struggling with these problems. Their partial solution has been approached in Germany by means of the universal insurance system; but in other countries it is still hopelessly distant. It is obvious that the great results which would inevitably arise from a radical application of these fundamental notions must be indefinitely delayed.

Meanwhile, in some of the directions which have been mentioned, and particularly in that of notification, praiseworthy efforts have been

made in various districts, and cannot fail to be productive, not only of local advantage, but of much wider utility in the shape of practical experience and of demonstration, and yet more of example. The educational value of any local action of this kind is very great. It is comparable to the educational value attaching to a period of residence in a sanatorium where the patient learns important lessons and is able to disseminate them. Only in this instance the education is not that of individuals but of the municipal bodies. One of the most satisfactory signs of the times, which may be read in the records of the past year, is the diffusion and the growth of public spirit in regard to the fight against tuberculosis. Local authorities have taken to heart the excellent object lessons which have been provided for them in isolated centres; and a good many of them are showing proof of spirited enterprise in the cause.

Outside the province of public health, where the indications are so clear and yet so far from their realization, we do not find the same directness in the line to be followed. All our present methods for the management and for the cure of the disease are still in the experimental stage, and our views and practice are therefore liable to variations. The past year has contributed notably to the latter in almost every department, but particularly in connection with the broader aspects of the sanatorium question and with the special aspects of the treatment of pulmonary tuberculosis.

Etiology is for our chief purpose of prevention the most important chapter in clinical pathology. H. Timbrell Bulstrode,[1] in the introduction to his great Report to the Local Government Board, does not speak very decisively as to the relative prevalence and virulence of the several modes of infection. These, it is well known, are identified with three theories: (1) Cornet sought to establish that the usual means of transmission was the direct inhalation of dust contaminated with particles of dried sputum. (2) Von Behring taught that infection was most commonly due to the conveyance of bacilli in milk to the alimentary canal of the infant, or young child, and to its invasion of the lacteals and lymphatic glands. In the latter they might remain latent for varying periods, but might ultimately break loose and lead to declared tuberculosis. (3) Calmette also urged that the alimentary tract was the usual route, but that the vehicle was not only food, but frequently also the infected droplets escaping as a spray from the mouth of consumptives when speaking or coughing, and swallowed with the saliva after being inhaled with the air in which they were floating. Thus the infection reaching the alimentary canal might be either human or bovine.

Putting aside the relatively unusual chances of percutaneous inoculation, these are the only modes of communicability with which we are hitherto acquainted; but the question remains still undecided as to which

[1] Sanatoria for Consumption and Certain Other Aspects of the Tuberculosis Question

of them is the more active. The doubts which had been raised as to the infective power of the bovine bacillus had been largely set at rest by the report of the late Royal Commission on Tuberculosis; and Nathan Raw, among others, has endeavored to show that it is not only infective, but that it is responsible for the production of the entire group of diseases usually identified under the name of Surgical Tuberculosis, including the glandular variety, and also for the primary tuberculosis of the serous membranes. Bulstrode's conclusion is to the effect that it is not improbable that a material amount of human tuberculosis is attributable to the introduction into the intestinal tract of tubercle of bovine origin. The practical aspect of the present etiological position is that we must continue to believe in the danger from cows' milk, and that the measures of protection from that danger should not be relaxed.

Some Factors Influencing the Prevalence of Tuberculosis. One of the boons of the prophylactic uses of sanatoria is that they remove for a considerable period of time a good deal of infectious material from the vicinity of possible victims. This cannot but tell upon the general prevalence of the disease. Military service where it exists is an important element in the question of prevalence. Formerly it was an agency for the propagation of tuberculosis owing to the infective condition of barracks and to the failure, due to improper diagnosis, to exclude from the ranks infected recruits. It is now, thanks to modern sanitation and to the rejection of all tuberculous cases, a period of exceptional freedom from the risks of infection for the individual, and of exceptionally strengthening influences likely to improve his health prospects for a lifetime. As the numbers involved are very large, the effect on the prevalence of the disease cannot fail to be quite appreciable.

General prosperity or the reverse must be reckoned among the chief factors of prevalence. In Ireland and Germany they are measured by the rate of emigration. It is found that the two values of emigration and mortality from phthisis, as pointed out by R. Lennhoff[1] keep more or less strictly parallel. Thus, in Prussia, where the emigration averaged 100,000 from 1881 to 1885, it had fallen to 18,000 in 1906. But from 1900 to 1901 there was a temporary check in the progress of both factors owing to the economical crisis which prevailed about that time.

Land drainage is regarded by Hamburger as having been even more telling than Koch's discovery of the bacillus; and as it began to be introduced in 1880, he regards it as the chief factor in the lowering of the death rate which occurred about that time, and which B. Fränkel and M. Michaelis credit to Koch's great discovery.

Max Wolff[2] attributes to the following influences the remarkable decrease of the mortality (from 31 to 17 per 10,000) in the last twenty years:

[1] Loc. cit.

[2] Sem. Méd., April 1, 1908, p. 167.

1. Greater care as regards sputum.

2. Isolation of many patients in hospitals; and exclusion from such occupations as those of teaching, or of retailing food.

3. Compulsory notification of deaths from phthisis pulmonalis, and subsequent disinfection.

4. Efforts made to lessen the overcrowding of tenements.

5. Infantile prophylaxis by the examination of nursery maids; and prophylaxis by school inspection.

6. Veterinary inspection, and medical inspection of food supplies.

7. Other measures, including the creation of sanatoria, which have dealt with 20,000 cases in ten years, and which remove those affected from their surroundings and allow them to return to the latter in a less infective state as regards sputum.

8. The Polyclinic or Dispensary system, which in eighteen years has caused 72,000 cases to be diagnosticated and made familiar with the elements of antituberculous hygiene and prophylaxis.

Why is Tuberculosis so Common in Ireland? There are few problems and few object lessons which possess equal importance with the reported increase of mortality from phthisis in Ireland.

Sir John Byers,[1] of Belfast, first discusses the causes assigned for this local prevalence:

1. As regards the *damp climate*. While in Belfast the death rate from phthisis was in 1906 2.77 per 1000, with a rainfall of 34.57 inches, in Glasgow, with its humid atmosphere and higher rainfall (35.80) inches, the phthisis death rate was only 1.5 per 1000. In Liverpool, a damp city, it is 1.82, and in London, with its fogs at times, the phthisis death rate in 1906 was only 1.42. Again, if we go to Dublin, with a rainfall less than in Belfast (27.73 as compared with 34.57 inches in Belfast), the death rate from consumption was 2.91 (that is, higher than in Belfast) for 1906. He cannot, therefore, admit that there is much in the dampness of the atmosphere as a cause of tuberculosis in Ireland.

2. *Dampness of the Soil* has also been assigned as a cause. But while the subsoil may be of some importance, it is now recognized that other conditions are of much more potency.

3. *Emigration*, it is held by some, has left behind a physically inferior population, very susceptible to phthisis. But there are serious scientific objections to this which he discusses. Notwithstanding the fact that emigration has produced a curious age distribution of population in Ireland (persons aged sixty years and upward are equal to 14.2 per cent. of the total population of Ireland, as compared with 10.4 per cent. of the total population of England, and as compared with 10.9 of the total population of Scotland), it is a remarkable fact that the birth rate, corrected for the number of women at child-bearing ages, and for the number of married women, has actually increased in Ireland, while it has

[1] Lancet, January 25, 1908.

decreased in England and Scotland, a fact which indicates that fertility and vitality have not decreased in Ireland. On the other hand, it is stated that in the United States (and figures have been given) the phthisis death rate for the Irish is higher than that for other nationalities.

4. *The Susceptibility of the Irish Race* has been alleged. Some said the Celtic (including the Scotch Highlander) is a soil upon which the tubercle bacillus grows with extraordinary facility. He denies altogether that Irishmen, as a race, are specially prone to consumption. Why was it that, according to the Registrar-General's return, Ireland in 1864, when there were far more Celts in the country, had a lower death rate from tuberculosis than either England or Scotland? Neither does he accept the view that a high consumption death rate is a sign of physical inferiority, any more than the existence of typhus in Ireland in the past. As in the cases of typhus, the prevalence was, and is, due to want of care being taken to stamp out the disease.

5. *Poverty and Social Position as a Cause of Tuberculosis.* Among those better housed, clothed, and fed the mortality is much less than among the poorer. Yet Ireland has enjoyed increased cheapness of food and of living; wages have increased, and the savings bank lodgements have increased to £6,970,000 in 1894 from £2,700,000 in 1870.

6. *Food and Drink.* The increased use of tea and white household bread, instead of the old porridge and buttermilk, and the excessive use of alcohol may have lowered the resistance of the people to the tubercle bacillus. As regards the quality of the milk, Sir John Byers is driven to the conclusion that the disease is propagated and children largely acquire it by ingestion through swallowing tuberculous milk.

7. *Industries.* According to some it is the influence of industries —especially in towns—which causes the high tuberculosis death rate. Now, it is curious that in Dublin they have little or no textile industries, as in Belfast, and yet the Dublin phthisis death rate is the higher of the two cities. This contributory cause, he is convinced, has been overstated.

8. *Want of Sanitary Reform.* Although the housing of the people in Ireland has improved, it is not at all equal to what it is in England. This must therefore be accepted as a cause for the prevalence.

9. *The Domestic or Home Treatment of the Advanced Cases.* This in his opinion is the most frequent cause, as recent experience shows that in any country, with the isolation of the "open" cases the death rate falls. Newsholme's explanation for the remarkable fact that typhus has disappeared concurrently with the increase of phthisis is that whereas for the former the population consented to use the Union Hospitals, they refuse to do so for the latter.

10. *Popular Ignorance of the Nature of Tuberculosis* is the other great factor, for it brings carelessness, indifference, and in the end even apathy.

For these evils, Sir John Byers' proposed remedies are readily enumerated:

1. Compulsory notification.

2. Segregation is the other indispensable measure. In Ireland, if we are to stamp out the disease, the institutional treatment of advanced cases of pulmonary consumption must be done on a scale not hitherto thought of, and such treatment must be made attractive.

Again, inexpensive sanatoria should be multiplied for the arrest of very early cases. Those too far advanced for sanatorium treatment, but still able to work, should be taught by district visitors and at special dispensaries how to deal with the sputum.

3. Education in general hygiene and in domestic hygiene is much wanted.

4. Temperance should be inculcated, not alone as regards drink, but in all things.

5. Lastly, the official inspection of meat and the control of the milk supply are measures of urgency which should not be further postponed.

The Personal Communicability of Pulmonary Tuberculosis. Some divergence exists between authorities such as Max Wolff and C. Hamburger in Berlin, and between J. Niven and A. Newsholme in England, as to the degree of the danger from case-to-case infection and from dried sputum. One of the most important chapters in Bulstrode's recent official report is devoted to these matters which bear so closely upon practice. The older statistics as to the incidence of the disease in the officials attached to hospitals and institutions, such as those by C. Theodore Williams at the Brompton Hospital, and by others at Falkenstein, Görbersdorf, Friedrichsheim, etc., in support of the non-infectivity of consumption, have been submitted by Bulstrode to a renewed mathematical analysis at the hands of W. H. Hamer, together with the opposite, and more recent statistical evidence brought forward by Cornet. The upshot is that the statistical evidence is much less strong than the conclusions that have been based upon them; and that in their light "sub-infective" (as suggested by Sir Hugh Beevor) would be a term more correctly applicable to tuberculosis, if the significance of the term "infective" is to be taken from the standard set by such diseases as measles, scarlet fever, smallpox, and the like. In short, the statistics are not very conclusive as to the contagiousness—in spite of the fact that we have all witnessed cases of transmission of the infection. Of course, we know that statistics are not to be regarded as convincing. But the conflict between the two sets of evidence is, in itself, valuable in so far as it points to the supreme importance which attaches to the factor of individual resistance; and therefore also points to the duty of doing much more by way of prophylaxis in the direction of building up the resistance of the predisposed subjects than even in that of removing from their path all the coarser sources of infection. In practical politics it

is a strong argument in favor of the policy which I have urged,[1] under the title of "Juvenile Preventoria First: Sanatoria After."

The Degree and Mode of Communicability of Tuberculosis by Sputum. With regard to this danger we are reminded by Bulstrode's report of the experimental data of Ransome and Delepine and of those of Cadéac which would prove the rapid loss of virulence of the bacillus of tubercle under exposure to daylight and air; and would detract from the importance of the experimental conclusion, arrived at by Koch, Cornet, and others as to the prevalence of a dust-borne infection by dried sputum. On the other hand, Flügge and his school identify the danger of infection with the inhalation of the contaminated spray suspended in the air even at some distance from the consumptive by whom it is coughed out or sneezed out. In this moist form the bacillus, they contend, escapes the disinfecting influence of sunlight. Their view would indicate a much greater need for some suitable mouth screen than for the sputum bottle, or at any rate for the more constant use of the Japanese or other variety of handkerchief.

The Present Position of the Sanatorium Question. The Open Air Principle is stable and underlies as a rock the whole modern treatment of consumption. As pointed out in the *British Medical Journal*,[2] it was advocated by Pliny the elder together with sunlight and pine exhalations, by Galen in addition to altitude, and in the Eleventh century by Avicenna. Hermann Brehmer (born 1826), of Gorbersdorf fame, the practical founder of the sanatorium treatment who was followed by Dettweiler, and to whose memory a monument has recently been unveiled at Breslau, utilized these ideas, including that of altitude (for the famous Sanatorium stands in a Silesian valley 600 metres above sea level). But the "open-window" doctrine had been first preached in 1784 by the notorious quack James Graham in the face of the prevailing superstition as to "nocturnal miasms." "He recommended people to sleep with all the windows of their rooms wide open. This is my own invariable custom, summer and winter, even in the wettest, coldest, and stormiest weather, and I never, never have a cold, low spirits, or any indisposition whatever. The free open cold air is a constant full cold bath for the outside of the body, for the lungs, for the mass of blood which passes through them, and consequently for the whole system of the friendliest and most efficacious kind."

Another Englishman, George Bodington, was the next apostle of open air and of cold air. His book entitled *The Treatment and Cure of Pulmonary Consumption*, 1840, was republished recently by Dr. Arthur E. Bodington.[3] He was also the complete originator of the Sanatorium idea as we now carry it out, and took patients into his own house at

[1] Practitioner, July, 1908.

[2] Editorial, February 5, 1908.

[3] London: Simpkin, Marshall, Hamilton, Kent & Co., 1908.

Sutton Coldfield, on the principle which he lays down for medical practitioners who have cases of consumption under their charge. "If they are to succeed, they should have country houses in proper situations, well ventilated, and provided with all 'appliances and means to boot,' where their patients should be under their own eyes and strictly watched and regulated in all respects as regards exercise, air, diet, medicine, etc., or there should be a certain class of practitioners who should exclusively pursue this practice as a distinct branch," to whom consumptives should be sent from towns instead of being "sent to die at some distant seaport." He also described the special hospital for the consumptive poor outside the towns—and the gardening and farming occupations for the convalescent. His great cure was ridiculed by Sir James Clark as the "beefsteak and porter system" and was effectually submerged by the medical press of the day.

Benjamin Ward Richardson's Decalogue for the Ladies' Sanitary Association (1855) contains an able advocacy of "open air." Lastly the late Sir James MacCormac's father, D. Henry MacCormac, of Belfast, devoted his life to preaching in vain "open air" as the only preventive and cure for consumption.

The Sanatorium Idea has had its phases, but seems to be returning to the original outlines sketched by Bodington. Too much had been expected at first. Resuscitation is not a conceivable result of sanatorium or any other treatment, and as it became evident that advanced consumption was incurable, and inveterate phthisis at the best very long to cure, all such cases were gradually struck off the list of suitable cases. Early cases were henceforth in demand, but the earliest stage of tuberculosis is always difficult to identify. The bread winner, too, is disinclined to give up his employment until he feels himself utterly unfit for work. Moreover he dreads the stigma which may in the future attach to him for having been the inmate of a sanatorium for consumption. It is not surprising then that some of the beds may have remained untenanted—a vacancy which assumes a peculiar significance when we bear in mind the number of those more advanced cases which might have filled them.

The Question as to the Practical Value of Sanatoria. In Germany doubts have been freely expressed, as, for instance, at the debate of the Society of Medicine of Berlin, on March 11, 18, and 25, as to whether the decrease of the mortality during the last few years can be fairly ascribed to the sanatoriums, seeing that in England where fewer of the latter exist the decline in the death rate has been practically the same. Moreover, from recent insurance statistics it would appear that at the end of four years after leaving the sanatorium, 42 per cent. only were able to continue at work. It has also been alleged that equally good results were obtainable from attendance at polyclinics. This statement is one difficult to prove conclusively. The result too must

vary with the cases. For many patients the rest and comfort of the sanatorium would make all the difference between gain or loss of ground.

R. Lennhoff and C. Hamburger, as well as Mosse and A. Plehn, were all inclined to attribute the decline in the death rate to other agencies than the sanatoria, and above all to that of increasing prosperity. This, it is contended, has told precisely in the same proportion in those countries, such as France, where sanatoria do not exist.

A. Fränkel,[1] who is as strong a critic as B. Fränkel, is an advocate for sanatoria, is ready to admit that they are useful, but he is convinced that they cannot exercise any marked influence upon the death rate from phthisis. He finds fault with the practice of admitting those suffering from anemia and other doubtful conditions to the exclusion of phthisis in the second and third stages. Even in the first stage the occurrence of any complication such as hemoptysis or feverishness leads to the patient's discharge at the time when he is most in need of care. The Directors of the Hospitals in Berlin are all agreed that sanatoria require to be thoroughly reorganized, and they are about to try the experiment of admitting into sanatoria a limited number of third-stage cases, for these are the real source of the infection. The attempts to isolate them have hitherto been unsuccessful. It is, for instance, well known that the Asylum which had been opened for them in Berlin had to be closed because none would apply for admission.

We are thus coming back to the original use made of sanatoriums for cases of confirmed disease. But the lead had already been taken in that direction by Arthur Newsholme, of Brighton, who started the admission of advanced cases on the limited period system, for the sake of treatment, and also in order to educate them in the practice of prophylactic measures. The same policy had also been suggested by Senator.

Does the Cost of Sanatoria Yield a Proportionate Return in Results? This must remain to a certain extent a matter of opinion. C. Hamburger has no hesitation in giving his reply in the negative, as he believes that the sums which sanatoria absorb might be invested in a more rational and profitable way. "For the cost of one sanatorium patient twenty might be sent to live in the woods." Whatever the results may have been in the past, we may hope for better, particularly with the help of Paterson's graduated labor method. In reality the present very serious questions are "whether some of the results might not be obtained independently of sanatoria, as alleged by some authorities," and "whether most essential requirements are not suffering complete neglect for want of funds." As I have insisted, since the infectivity of the more isolated advanced cases cannot be eliminated, it is urgent that all deli-

[1] Loc. cit.

cate children in their vicinity should be removed from that danger, and fortified by a sufficient stay in a *Juvenile Preventorium.*

The Diagnosis of Tuberculosis. *The Ocular Reaction.* For the diagnosis of tuberculosis we owe to Calmette and to von Pirquet two important additions to our previous methods, both of them recommended by their simplicity. Calmette's Ocular Reaction method introduces into the conjunctival sac one or two drops of an exceedingly dilute solution of tuberculin. Congestion and even mild conjunctivitis will set up within a few hours if tubercle should be present. A very extensive trial has already been made of this test, and the general verdict may be said to be favorable. It is too early to speak with authority; but clearly reservations will have to be made both as regards the reliability of the conclusions and the safety of the eyes, as the dose, if too weak, may fail to yield a positive result, and if, on the other hand, too large, may occasionally set up a troublesome conjunctivitis.

The Tuberculin Dermo-reaction; and von Pirquet's Allergy Method of Diagnosis. Allergy is the name given by von Pirquet[1] to the difference noticeable in the behavior of the organism when any novel or unaccustomed infection is introduced, as compared with its behavior toward accustomed agents of infection. He utilizes that principle in his tuberculin vaccination test in the following fashion. Two separate drops of solution of old tuberculin are placed upon the arm at a distance of 6 cm. He then proceeds to scarify the skin in three places, namely, *first, half-way between the two drops*—and subsequently in the centre of both. Nothing happens at the "Control vaccination spot," but the two others will present within twenty-four hours if the subject be the bearer of tubercle, bright-red papules of from 5 to 20 mm. in diameter, without the occurrence of any constitutional symptoms. A delay of one or two days implies that the tuberculosis is dormant. Obsolete caseous deposits do not always react; and again the reaction does not occur in the profound cachexia of the last few days of chronic phthisis, nor in the late stage of acute miliary tuberculosis and of tuberculous meningitis.

By using different strengths of tuberculin at the two spots of infection it may be possible to form a quantitative estimate of the individual sensitiveness to the poison. Von Pirquet's formula is as follows: One part old tuberculin, one part glycerin of carbolic acid, and two parts normal saline solution.

The Tuberculin Cuti-reaction of J. Lignières and Berger[2] is a further simplification of the tuberculin test. Von Pirquet had discarded the injection; they now discard the scarification. All that is needed is a razor to clear the skin; and into the clean shaved place some pure tuberculin has to be rubbed. Tuberculous subjects will give a reaction

[1] Therap. Monats., November 12, 1907.

[2] Acad. des Sci., October 28, 1907; cf. Bull. Méd., 1907, No. 86.

within twenty-four hours. The test may be repeated as often as desired; and it will not be interfered with by any concurrent tuberculin injections. Although there is a lack of absolute reliability in both these cutaneous methods, their simplicity and their harmlessness are definite recommendations.

Still greater simplicity of procedure is aimed at by H. Noegeli, Akerblom, and Vernier, of Geneva, in their contribution to the diagnosis of tuberculosis.[1] They are content with rubbing the skin with a *dead* culture of tubercle bacilli, or, failing this, with Koch's tuberculin. The reaction is to be looked for within the twenty-four hours.

The Tuberculin Salve is the latest addition to our list of ointments. E. Moro,[2] who has compounded it of equal parts of Koch's original tuberculin and of anhydrous lanolin, rubs about $\frac{1}{10}$ gm. of it into the skin of the epigastrium or of the pectoral region, for one-half to one minute, over a surface about two inches in diameter. He describes three degrees of positive reaction: (1) Only a few pale-red nodules appearing between twenty-four and forty-eight hours after the application, and lasting several days, constitute the mild reaction. (2) A moderate reaction consists in the appearance within twenty-four hours of a number of bright-red nodules, with some initial itching. (3) The severe reaction is still more rapid, and the number of papules exceeds 100. Their size is also larger, and may reach a diameter of 5 or 8 mm. The eruption tends to spread beyond the seat of the inunction. There is always some itching.

The papules obtained in these reactions simply dry and desquamate. There are no constitutional symptoms of fever. If the favorable account given of this "Percutaneous Reaction" by Moro should be confirmed, the method will be of all others the most readily available, particularly as the ointment will preserve its activity for months if kept in a cool place.

The "Skin Puncture Reaction" of Epstein. F. Hamburger[3] supplies the interesting information that so long ago as 1891 Epstein called attention to the redness and swelling observed where a subcutaneous injection of tuberculin had been made. Escherich called this the "Puncture Reaction," and Spengler also regards it as specific. This neglected reaction is the most delicate, the most sensitive, and the most harmless of all the differential reactions that have recently been published, for it persists through four or five days; and in Hamberger's experience in a series of 200 children it has proved positive in many cases which did not give satisfactory reactions with other methods. As regards its reliability, he has satisfied himself by the tests of direct clinical demonstration and of the indirect testimony of other methods, as well as by postmortem verification, that the skin puncture reaction is to be depended upon.

[1] Therap. Monats., January, 1908, Heft 1, p. 33.
[2] Münch. med. Woch., February 4, 1908, p. 216.
[3] Wiener klin. Woch., March 19, 1908.

Epstein's long-overlooked observation is in curious contrast with that of the illustrious Edward Jenner. The local reaction of vaccinia is so much greater that it naturally centred upon itself immediate and entire attention; and the constitutional and pathological aspects were slowly worked out in the course of the last century. But in the case of tuberculin it was the pathological and bacteriological events that monopolized clinical observation; and innumerable tuberculin injections have been practised without the local reaction being so much as noticed.

Criticisms of the Tuberculin Methods of Diagnosis.—Among the systematic test trials to which the method of von Pirquet has been subjected, one of the most important is that of Engel and Bauer.[1] Von Pirquet, in whose negative cases no tubercle was ever found post-mortem, had observed from the occurrence of a positive reaction in one single case that *status lymphaticus*, of which the patient gave signs, must be intimately related to tuberculosis. Of the six positive reactions obtained among forty-eight infants (in the aggregate series of 300 children vaccinated), one infant showed no trace of tuberculosis after death, and was quite free from any suspicion of status lymphaticus; whilst four other infants continued free from all clinical symptoms of the affection, and at a later date failed to react to the test by subcutaneous infection of tuberculin, although we know from Binswanger's investigations that infantile tuberculosis always reacts. Engel and Bauer do not therefore consider that von Pirquet's reaction is reliable at any rate in infants, although in older children they did not find it wanting; and they do not think that it can take the place of the subcutaneous injection method.

Evidence of this sort, and this is only a sample out of a considerable batch, must make us very careful not to be misled by the many enthusiastic reports which have been published, into awarding our confidence unreservedly to this or to any of the other epidermic tests. A longer time must elapse and an authoritative inquiry must be organized before a satisfactory conclusion can be arrived at. We need not therefore at this early stage attempt to record in this report the individual results which have been obtained by a host of investigators.

As regards the ophthalmotuberculin test of Calmette, the dropping of a 1 per cent. tuberculin solution into the conjunctiva from a sealed capillary tube, such as that used for glycerized vaccine, is so convenient that it is much to be hoped that the test may be found capable of sufficient reliability to be worth adopting. A great number of reports have already been published—so many that it would be difficult to quote them all, and much more to do them justice. Whilst some of the observers are enthusiastic, and very few are distinctly hostile, there are considerable discrepancies in the results which have been obtained. The wisest

[1] Berlin. klin. Woch., September 16, 1908; cf. Epit. Med. Journ., May 16, 1908.

course for the present is to watch the outcome of further trials, and the development of further technical improvements. According to some observers a positive reaction is not in itself conclusive, and needs to be corroborated by a searching physical examination, as the ocular reaction has been obtained not only in some other affections, but also in the healthy. On the other hand two or three or more repetitions of the instillation have had to be made in some suspected cases before the positive result was obtained. This points to the danger of being misled by a negative result. The same objection, of course, also applies to the hypodermic test and to the percutaneous test. They are all confirmatory tests, and they leave us committed to a physical examination in reality yet more thorough than ever before.

From the brief review which has been given it is seen that we are not suffering from a dearth of diagnostic tuberculin methods, but rather from their embarrassing wealth. But the latter brings forcibly to mind the conclusion that they cannot all be of equal worth, or equally desirable. They each and all have their adherents, whose specialized experience leads doubtless to specially good results in the use of the particular method. On the other hand it is only a close comparative study of all of them by the same observer or combination of observers that can possibly determine their relative value and the relative advantages and drawbacks which may guide us in selecting from among them that which is to become the recognized tuberculin diagnosis method.

The Treatment of Pulmonary Tuberculosis. THE TUBERCULIN TREATMENT. The revival of Koch's treatment which began some years ago had been steadily gaining ground. Considerable impetus has been added to that tendency by the spread of Sir Almroth Wright's teaching, particularly during the last year. We are now in the fulness of the "Opsonic Era;" and we are beginning to witness the evolution of collateral ideas and methods from the work which has been bestowed upon the opsonins. The general influence upon the tuberculin treatment itself has been to lessen everywhere the strength of the injections and thereby to minimize the chances of their producing any harm. And this again has told in favor of the reputation of the various kinds of preparations which have been employed, and has resulted in their being used with greater confidence and on a wider scale.

Vaccine Therapy and Active Immunization bear so closely upon the theory and the practice of the new method that it is necessary to furnish as an introduction a brief sketch of the bacteriological foundation such as A. C. Inman[1] supplies in his paper. This foundation we largely owe to Sir Almroth Wright's investigations. Resistance to infection means for the greater part a vital *protective action* exercised by the blood; and in order to study that action Wright utilized a modification of Leishman's

[1] Lancet, January 25, 1908.

method, and was able to isolate for investigation the three factors in phagocytosis, namely, the *white corpuscles, the bacteria, and the serum.* The result of these researches was the discovery of the opsonins and of the principles of vaccine therapy. The object of the latter is to stimulate and to educate, as it were, the protecting blood-function. The positive phase is that of raised efficiency due to a stimulating dose; but the phase would be negative and the system unprotected if the dose of the poison had been so strong as to prostrate the protecting blood-function.

Auto-immunization is the same order of things enacted within the organism itself at the expense of its own stores of tubercle and tubercle toxin, the patient either undergoing spontaneously or inducing at will an auto-inoculation with the toxin analogous to the inoculations artificially produced by doses of the tubercle. The occurrence of these auto-inoculations and of their effect upon the serum was shown in the most striking manner by Freeman's observations on gonococcus arthritis when the joints were submitted to massage. "Auto-inoculation follows upon all active and passive movements which affect a focus of infection and upon all vascular changes which activate the lymph stream in such a focus," and "when bacteria or bacterial products are made to pass into the general lymph and blood stream, intoxication effects and immunizing responses similar to those which follow upon the inoculation of bacterial vaccines must inevitably supervene." It is a justifiable inference that nature's curative results are obtained by means of these auto-inoculations. At any rate it is by watching their occurrence with the thermometer and with the opsonic count that the curative effects obtained by the method which we shall now describe have been traced to them.

The Opsonic Index in its Relation to the Tuberculin Treatment. Touching this practical question of the day, the latest pronouncement from the side of the strict opsonic index doctrine was made by Sir Almroth Wright in his Harveian Lecture on March 26, 1908, "On Some Points in Connection with Therapeutic Immunization.[1] To obviate these ill-effects which resulted from tuberculin inoculation when it was first used for therapeutic purposes, from giving too large doses of vaccines, the determination of the opsonic index both before and after inoculation always serves as a useful guide as to the dose of vaccine and as to the time of giving it. If the index is not determined, then, for safety's sake, a very small dose of vaccine is usually given, and often the full beneficial effect is not obtained.

1. In some cases of staphylococcus infection, where there is a local visible lesion, *e. g.*, a boil or carbuncle, then the action of a given dose of vaccine can be observed by the local effects produced, and thus the dosage can be gauged; the same guide is present in some cases of tuberculous lesions of the skin.

[1] Med. Press and Circ., April 15, 1908.

2. In some cases the pyrexia present serves as a guide to the therapeutic effect of the vaccine, but where the temperature becomes normal, often the lesion is not healed, and then the opsonic index is the only reliable guide to the dose to be used. This applies to the treatment of pulmonary tuberculosis by inoculation.

3. In some chronic cases, where the treatment is of long duration and the progress slow, *e. g.,* in tuberculous disease of the joints, cases of cystitis, etc., the determination of the opsonic index is necessary as a guide to the dose and time of inoculation.

4. In some cases where the symptoms are latent and the lesion is not visible the index must be taken.

5. In cases where the disease is running a rapid course, *e. g.*, in septicemia, there is danger in attempting to determine the dose of vaccine by the therapeutic effect produced for two reasons: (*a*) time does not admit of delay; (*b*) an excessive dose may be fraught with great danger. In these cases the opsonic index is the only reliable guide.

6. In some cases, a single dose of vaccine effects a cure, and here the experience of previous cases gives one an idea of the dose to use. If this is followed by the desired result, it is, of course, unnecessary to determine the opsonic index.

In "The Pathology of Inflammation," Sir Almroth Wright pointed out that there are two important factors: (1) the emigration of the leukocyte (Metchnikoff's theory); (2) the transudation of lymph.

Thus in cases of any local inflammatory lesion:

1. It is important that there should be a plentiful local supply of blood and lymph.

2. It is important that the blood and lymph should have protective substances.

3. It is important that a plentiful supply of healthy leukocytes should find their way to the local lesion.

Instances of the "Miscarriage of Inflammation" were furnished thus:

1. Where there is excessive serous effusion and too few leukocytes, as in a tuberculous serous pleural effusion.

2. In abscess formation, where the leukocytes are dead, where the protective substances are absent from the fluid exuded, and where the digestive action of the fluid produced by the disintegration of the leukocytes has an inimical effect on the healing process.

3. Where a sinus or a fistula is produced, or in cases where there is much induration around a lesion, the healing processes of inflammation are retarded by the adverse local conditions.

4. In cases where there is great dryness of the tissues affected by the inflammatory process the deficient supply of protective substances owing to the small amount of fluid exuded delays recovery.

There are many instances of the manner in which these miscarriages of inflammation could be remedied, *e. g.,* (1) by removal of excess of

fluid in "serous effusion," and abscess; (2) by the flushing of the local lesion, in cases where there is a deficient supply of lymph to the part by citric acid internally or locally by applying NaCl solution and sodium citrate; (3) lastly, the protective substances of the lymph can be increased in amount by the therapeutic administration of an appropriate vaccine in proper doses.

Practical Tuberculin Therapy. Good suggestions for the use of tuberculin in pulmonary tuberculosis, with particular reference to the administration and dosage of Deny's tuberculin are offered to us by Paul H. Ringer.[1] First, as to the indications, tuberculin may be employed in:

1. All incipient cases, cases of closed tuberculosis in which ulceration has not taken place and bacilli are not to be demonstrated in the sputum.

2. Uncomplicated non-febrile, first and second stage cases.

3. Fibroid cases not running a febrile temperature.

4. Febrile cases in which the temperature does not drop under treatment by rest, and where fever is due to the tuberculo-toxin alone and not to mixed infection. In such cases tuberculin should be administered with the greatest caution, in the most infinitesimal doses, with long intervals between successive doses.

5. Advanced third stage cases. Tuberculin can here occasionally be used, not as a curative agent, but to aid in relieving distressing symptoms. It will often relieve the tight, harassing cough that is so exhausting, render expectoration easier, do away with thoracic pain, and help to make the patient more comfortable. In such cases its administration should be most guarded and the dosage very minute.

The Contra-indications are:

1. Greatly emaciated or greatly weakened individuals. The general body strength must first be raised to supply those defensive forces which tuberculin stimulates to action.

2. Third stage cases with mixed infection constitute the most absolute contra-indications.

3. Hemoptysis occurring during the administration of tuberculin is a signal for cessation at once and for some time.

4. Heart disease is a contra-indication only if it is feared that owing to the possibility of reactions compensation may be lost.

5. Marked increase in pulse frequency, beginning and persisting during administration of tuberculin.

6. Marked loss of weight, beginning and persisting during the administration of tuberculin.

7. Complications, such as diabetes, nephritis, hepatic cirrhosis, hysteria, neurasthenia, epilepsy.

[1] Jour. Amer. Med. Assoc., May 2, 1903.

Ringer's conclusions are to the following effect:

1. Tuberculin is the most valuable adjuvant to fresh air, rest, good food, we possess in the treatment of pulmonary tuberculosis.

2. Deny's tuberculin seems to be suited to establish an active antitoxic immunity, the type of immunity capable of doing the greatest good.

3. Tuberculin is indicated in many types of cases, and in the hands of a competent administrator will do no harm.

4. Reactions are often overlooked; they are not to be desired, and when frequent or violent are distinctly harmful to the patient.

5. The dosage should at first be infinitesimal; increase should be very gradual; the word "haste" has no place in tuberculin therapy.

6. Time and tolerance bring success in the treatment by means of tuberculin.

7. Tuberculin should never be used save in conjunction with strict hygienic and dietetic measures.

The very favorable account conveyed by these observations is worth noting. It is, however, analogous to those reported by observers using other varieties of tuberculin. The question as to the relative value of the various preparations is an open one, and judging from the open state of mind of some of the best physicians who, for instance at Davos and at Leysin, have tested one preparation against the other, it is perhaps less a question of the mode of preparation than of the careful selection of cases, and of the dose and its frequency in each individual case.

The Oral Use of Serums. This subject was recently brought before the Royal Society of Medicine by Dr. Arthur Latham.

The first publication of the method seems to have been that of D. Montgomerie Paton,[1] of Melbourne, "A New Method of Serum Therapy;" and this was followed by his book on *New Serum Therapy*, 1906. For eight years he had been studying, clinically and experimentally, the use of serums exhibited by the mouth. During that time he had used over twenty million units of antidiphtheritic serum and forty gallons of simple plasma of the horse, sheep, and ox. This article made a short statement of some of the results obtained, but the writer hoped to put the whole work more fully before the profession in book form. In the treatment of over fifty cases of tuberculosis of all kinds the oral use of the simple plasma of the horse and sheep proved itself capable of transferring to the patient the resistance of the animal to the disease. In a later communication, the comment made by the *Medical Press* was as follows: "Montgomerie Paton's observations deal with the passive raising of the opsonic index by immune serum administered by the mouth. Should these observations stand the test of extended clinical experience, they may possibly advance the science and art of serum therapy by leaps and bounds."[2]

[1] Med. Press and Circular, Jan. 31 and Feb. 7, 1906. [2] Ibid., June 2, 1907.

Meanwhile, E. C. Hort[1] had worked at the same subject independently, and he refers to Paton's researches and results.

Hort says that his attention was first drawn to the subject by the work of Dr. Emil Weil, of Paris, on the treatment, by fresh animal serums, of hemophilia and allied conditions, and by Dr. Perthes' observations on hemophilia. These observers, believing that a deficiency in coagulation power was an important factor in the blood in such diseases as hemophilia, sought to remedy this by giving an artificial supply of fibrin ferment. With this object Weil gave intravenously or subcutaneously injections of various animal serums in doses strictly limited in quantity to avoid "inverted action," such as obtains in the analogous case of calcium salts. As the clinical results of giving serum in this way in severe cases of hemorrhage were, apart from hemophilia, most disappointing, Hort gave much larger doses by the mouth and gave it repeatedly, and found it possible to control severe hemorrhage in cases of purpura, acute hematemesis, and in cases of tuberculous hemoptysis otherwise uncontrollable. Further, a most remarkable improvement in the clinical symptoms and in the condition of the blood followed in cases of many affections in no sense hemorrhagic, such as chlorosis and ulcer without hemorrhage. Hence whatever value normal therapy may prove to have, it does not seem obviously connected with supplying fibrin ferment.

Hort's first publication of his results was made in the *Lancet*, December 21, 1907, p. 1744. He is proceeding with his research. The list of the affections which he has already treated or proposes to treat includes gastric and duodenal ulcer, with and without hemorrhage; chlorosis and other forms of anemia, hemophilia, purpura hemorrhagica, tuberculous peritonitis, hemoptysis, ulcerations of all kinds, pulmonary edema, pneumonias, etc.

Arthur Latham's investigation in conjunction with H. J. Spitta and A. C. Inman has related to the administration of *tuberculin* (T. R.) and other vaccines by the mouth, together with (*a*) normal saline solution and (*b*) fresh horse serum. The use of tuberculin and other vaccines on a large scale has been delayed owing to (1) the fact that the hypodermic method of administration has to be employed, and (2) the necessity, in most instances, of making frequent estimations of the opsonic index in order to determine the proper intervals between the doses. On the assumption that immunity against certain diseases was often due to the absorption of the products of dead microörganisms from the alimentary canal, it was decided to try the effect of administering various vaccines by the mouth. Further, the fact that the destruction of tissue in tuberculosis varies immensely in different cases suggested the possibility of some deficiency in the patient's serum. As there was evidence

[1] Lancet, February 15, 1908.

of the value of various antiserums, such as antidiphtherial serum, in diseases other than the specific disease, and of horse serum in hemorrhagic conditions when administered by the skin, mouth, or rectum, fresh horse serum was given in a number of cases in order to determine whether it could supply some substance in which a patient's serum was deficient, or to stimulate the production of some such substance. The opsonic index was simultaneously determined. The cases were of advanced pulmonary tuberculosis, tuberculous peritonitis, tuberculous disease of glands and hip, and cases of streptococcic, staphylococcic, and pneumococcic infection. The evidence, clinical and bacteriological, seemed to show that satisfactory immunization could be produced by the administration of vaccines by the mouth. In tuberculosis and other diseases of bacterial origin in which fever was present, there was a definite relation between the curve of the opsonic index and the temperature, the two varying inversely. In such diseases the temperature, even when normal or subnormal, afforded some guide to the changes of phase in the opsonic index; and from a study of the temperature curve and the clinical symptoms alone, it might become possible to dispense with the systematic estimation of the opsonic index. Horse serum in certain cases increased the opsonic content of the blood.

Spengler's Inoculation Treatment of Tuberculosis has been submitted by Josef Hollós,[1] of Buda Pest, to renewed investigation. He says: "The treatment consisted only in the systematic administration of the injections: and the results were such that Hollós expects that further experience of the Spengler treatment will cause a great change in the method of dealing with tuberculous patients, for the severer cases will probably be admitted into the sanatoriums for the sake of isolation, while those whose symptoms are mild will be treated at their own homes and will continue to work for the support of their families."

The Intravenous Injection of Tuberculin. It is claimed by F. Mendel for the intravenous method in preference to the subcutaneous that it is painless, that it is accurate, and that it is reliable. When 0.1 mm. is injected, and this is the usual dose, diluted with salt solution, or an arsenical solution, the whole of that amount is got into circulation, and there is none of that delay in the reaction, that cumulative process, and that lingering fever which are apt to attend upon the subcutaneous method. It will be of interest to hear the verdict of the majority of the authorities in experimental bacteriology as to the safety of the proceeding. Theoretically the tuberculin should be safe to inject, irrespective of the mode of its injection. But there can be no doubt that if it should chance not to be as desirable as intended for a given case, the intravenous method deprives the organism of any oppor-

[1] Lancet, March 21, 1908.

tunity of localizing its action, or of mitigating the abruptness of its operation.

Another New Treatment for Tuberculosis is based by Lemoine and Gerard, of Lille, upon experiments to prove the antitoxic action of the liver and upon the demonstration of the antitubercle immunizing properties of cholesterin and bile extracts in the guinea-pig. The results obtained during the last three years, in upward of 250 patients, by subcutaneous injection have been very satisfactory.

The Sleeping Canopy is an admirably simple device originated by Charles Denison, of Denver.[1] The head of the bed is placed in front of the window, and curtains which are tacked to the outer rim of the inside window-casing are made to enclose it so that the sleeper when the window is open is almost in the outer air, although the room itself does not receive much air from that window and can therefore be kept warm.

"The invalid may thus, tentatively, inure himself to more and more air; the window may be partly or wholly opened. The sleeper, when he arises in the morning, or if he has to get up at night, comes from his tent into a warm room. If economy of space room is a desideratum, the canopy when not in use can be pulled up by its frame to overlay the casing of the window and there remain until it is again needed. If the bright sunshine in the morning needs to be shut out so as to prevent waking the sleeper, or greater privacy from the neighbors is desired, or if the invalid wants to have the great advantage of sun baths, with or without oil rubbings, at suitable times during the day, a dark window shade may be provided to unroll from the near window sill to stop at any height desired. The canopy curtains can be made large and long enough to encircle the exposed sides of the bed, reaching to the floor and in front be buttoned or be fastened to each other with hooks and eyes or safety pins; they can also be tucked under the mattress so as to shut out all violent drafts or wind."

Climate and Altitude. *The Relative Value of High and Low Altitude in the Treatment of Tuberculosis.* F. M. Pottenger[2] rather supports the heterodox view that high altitude is not an essential in the treatment of tuberculosis, and that the great majority of cases can be treated to best advantage at low elevations. His arguments are largely based upon the assumption "that high altitude treatment is contrary to the principle of rest in inflammations in general and in tuberculosis in particular. The accepted principle of treatment in tuberculosis is rest, and it is employed whenever possible, so it is well to stop and inquire whether or not we should make an exception in the case of the lung, and, if so, why so?"

The nature of the answer to the questions so clearly put is of supreme importance to the patient. It is manifest that as the majority of cases

[1] Jour. Amer. Med. Assoc., December 7, 1907.

[2] Journal of Balneology and Climatology, January, 1908.

will improve if taken into due care quite early, any climate in which they are treated will get the credit for that improvement. But might not still better results have been achieved elsewhere? The patient who gets nearly well but not quite well is entitled to push that question home—and he is one of a large class. Putting aside the exceptional persons and the exceptional conditions in which rarefied air is to be vetoed, the test of experience declares, in the case of average consumptives as in that of healthy individuals, that the mountain is hard to beat in its renovating effect; and if the question be put to them all round the verdict of the majority will be "Nil melius." Thus, on the general question the conclusion would seem to be that it would be inexpedient to deprive the patient with delicate lungs of trying his possibly better chances, perhaps his best chances, merely on *a priori* grounds of theory.

The question as to the value of rest in inflammation, and in particular in tuberculosis, is a very large one, to which allusion is made elsewhere. The aspects from which it has been regarded have varied from time to time. Almost opposite lines of practice have been adopted in the same localities and in the same institutions, each in succession claiming to be the true doctrine. Nay, at one and the same period we have witnessed "the best results" from the Nordrach treatment by exercise, and "best results" also from the complete rest-cure! It is obvious that we cannot base any practical argument as to treatment upon the foundation of any principle being "an accepted principle."

Again Pottenger says: "It seems unreasonable to place an individual who is deprived of a portion of his aerating surface under conditions where he is subjected to a natural demand for more respiratory effort and one whose heart is undergoing an extra strain under circumstances where it will be subjected to more strain. It also seems unreasonable, he contends, to place one who is suffering from the severe bodily drain incident to tuberculosis, whose vitality is lowered, and whose bodily functions are interfered with, in such conditions as to be called upon for an exaggerated tissue change, such as is required to meet the demand which is made by a high altitude. This consideration calls in question the advisability of sending those who have advanced lesions to a high altitude, and suggests that if a high altitude is the best place for treating tuberculosis, only those who have slight lesions should be chosen for such treatment. Further consideration would also suggest another important limitation, that is, of early cases, only those should be sent who are able to meet the extra demand made upon them by the climatic conditions."

The limitations suggested are eminently commendable, although the anxiety displayed in the reservations mentioned is perhaps excessive If the same theme might be handled in a slightly difficult key by one of considerable Alpine experience as regards tuberculosis, the following facts are good guides in the selection of cases. For the confirmed con-

sumptive when not too far advanced life in the altitude is a luxury, for it will be generally a brighter life and more hopeful, and probably a longer life. But for the early sufferer who wants to get well quickly the altitude is indispensable as a "certainty of doing the best thing." Of course, even the best thing does not succeed in all instances. But the probability of success will increase immensely in proportion to the earliness of the case. There are those so prone to infection and so difficult to save from tuberculosis that even the mountain might not avail unless they resorted to it before the invasion. Thus the highest curative power of mountain air is the power of prevention. This is attested by the history of the local populations. The mountain does not breed tuberculosis; and it tends to discourage its development in those threatened with it. The value of this preventing virtue is hardly suspected at present. It is certainly not utilized as it deserves to be, and as it inevitably must be when the "*Preventorium*" idea has received its due recognition and has taken the precedence which belongs to it over the "Sanatorium" idea. Meanwhile, whenever this is feasible, the mountain is the place whither the subject under mere suspicion should be sent immediately. At that stage a few weeks, perhaps a few days, will decide whether it was a mere pin-prick or a serious inoculation. He may not have had any tubercle, but he was confessedly near getting it; but from his short altitude treatment he will return a very unlikely candidate for tuberculosis. Should, however, the diagnosis happen to have been justified, then he has availed himself of the best curative climate that exists, and of the stage at which the best results of that climate are to be secured.

The degree of the altitude is a very important matter. Some of the altitudes are unnecessarily high; and doubtless Pottenger had these in view when he referred to the strain they entail upon lung and heart. An altitude of between 4000 and 5000 feet is quite sufficient, and will prove eligible without any drawback for the great majority of cases. Above that level discrimination has to be made much more closely between individuals. It is to that moderate altitude that the present remarks directly apply.

The ideal altitude climate is a "protecting" climate even more than a "bracing" climate. Bracing climates are not wanting in the plains. Even, therefore, were we to adopt Pottenger's view that the plain is the better climate for the consumptive, the answer would still have to vary with the particular climate of the given plain. Plains might easily be enumerated with climates not only tonic but singularly searching. In a full list of low lying resorts every description of climatic quality will be found in a descending scale down to the depth of "relaxation," a wide field for contrast in prescribing climatic change. But the quality "altitude" is not included in that list. It is entirely different from anything which that list contains. In reality, short of "life in a balloon," there is no substitute for mountain air at a low level.

The specific value of the altitude lies precisely in the direction of those points where risks are dreaded by Pottenger. It is true that there is extra labor of respiration and some extra cardiac work too. But let the altitude be moderate, and these will not be serious objections. Call them stimulations, and it will be agreed that the remedy fits the disease. For many decades medical opinion has not swerved from the position that tuberculosis was based upon two defects: Local atony of respiration and of circulation at the apex and general atony of the circulation as represented by deficiency of cardiac strength. The common-sense treatment for these tendencies upon which the fatal disease is grown is appropriate stimulation and that increased activity which this calls into play. The altitude prescription, whether for the jaded or for the tuberculized, reads "Cardiopulmonary Stimulation." Its dose can only be learned by local experience, and it can be reduced to the needful attenuations by adjusting the indispensable corrective bodily rest. The altitude cure understood and carried out on these lines reads, as we all know, "Cardiopulmonary restoration."

"Another important anxiety in the treatment of tuberculosis is," Pottenger remarks, "the after-result. Patients who secure an arrestment of their trouble at high altitude must remain there afterward. The explanation of this might be suggested by another observation, that is, that tuberculosis is common among athletes." It seems to him "that the reasons for this lies in the overstraining. Athletes are subjected to more or less constant strain. Their heart and lungs become larger than is necessary to carry on the ordinary duties of life. When they leave the athletic field they have more lungs and heart than they need. Nature attempts an adjustment. A retrograde process supervenes, the organs become more or less flabby and less resistant.

"When adjusted to a high altitude the heart and lungs increase in size just as those of the athlete, and when one returns to the low altitude heart and lungs must undergo a readjustment; a retrograde process must take place. In the case of tuberculosis it is probable that during this time the tissues are not so resistant as usual, and that the patient, unless his process has attained complete healing, is prone to have renewed activity in the old process."

It would be tempting to follow the author step by step, and to endeavor to meet each of his arguments in succession. This would involve much more space than is available, and might prove unsatisfactory in the end, because the question is a clinical question, not amenable to any rigid standard, but governed by practical judgment and observation rather than by mathematical demonstration. It is but too true that many will soon relapse who leave the altitude. But "relapse" implies some previous "recovery;" and with the latter the altitude is perhaps to be credited, in some at least of the cases; indeed Pottenger's argument is based upon the fact that there has been increase both in heart and in lung.

In that connection it may be pointed out that this gain of the patient is not quite comparable with the gain of the athlete. The latter starts upon his training a picked man among the healthy. Unless destined for the life of a laborer his muscular increase after full training is a superfluity. But our patient before his altitude training was much below the normal muscular efficiency, and unfit even for his routine work. Lucky, if at his best he should at least approximate to the vital capacity and to the systolic energy which were once his own. His hard-won recuperation does not even amount to a *restitutio ad integrum*, and none of it can he afford to lose. In short, to make up for the help of the altitude which he misses, he will need to put in a great deal more health study and health labor than when he was there. Could any better plea be possibly advanced for the value of the climate of the altitude?

Rest and Exercise in the Treatment of Tuberculosis. Great as the boon has been in connection with the tuberculin treatment, a still greater therapeutical service has been rendered by Wright's work in leading up to what seems to be a satisfactory solution of the antagonistic claims of the rest cure and of the cure by exercise. It is well known how the notion advocated by Brehmer, that exercise in the open air had a curative value, had, perhaps been too freely put into practice and was supplanted by the doctrine of more or less "rest for damaged lungs;" but that in spite of this, Walther continued to produce at Nordrach striking proofs of the excellent results of the exercising plan. This conflict of views and of practice was perplexing; but with the help of the opsonic index the apparent contradictions have been to a great extent explained away. A new departure has been made in the systematic management of phthisis on lines henceforth thoroughly controlled by accurate observations.

Graduated Labor in Pulmonary Tuberculosis.[1] Marcus S. Paterson's epoch-making paper was brought forward, together with Dr. A. C. Inman's paper on the "Effects of Exercise upon the Opsonic Index," before the Medical Society of London on January 13, 1902. They deserve to be read in extenso, but the following account will give a general idea of the work and achievements superintended by Paterson at the Brompton Hospital's Sanatorium at Frimley in Surrey, of which he has the management. The Sanatorium is situated on the Chobham Ridges, at an altitude of 380 feet. It contains 78 beds for men and 30 for women.

Finding that some of the patients who were admitted "straight from work" were in a very fair condition, Paterson conceived the notion that, contrary to the prevalent doctrine, manual work might not only serve as an occupation for the idle days of sanatorium existence, but at the same time improve the health and resistance, and render possible a more immediate return after discharge to the previous routine of work. This

[1] Lancet, January 25, 1908.

line had all the while been steadily followed, as is well known by Otto Walther; but the exercise patronized at Nordrach had been almost exclusively that of walking. In giving a trial to this new notion, Paterson had to reckon with two sets of objections—the prejudice, suspicion, and disinclination of the patients; and the pessimistic suggestions (1) that the disease would become active again under strain, and (2) that the exertion would tend to produce hemoptysis. Great care was therefore exercised in the selection of cases. And the first exercise prescribed was walking, the distance being gradually increased up to ten miles a day. The subsequent experiences of shovel, spade, and basket-carrying work having proved a success, a carefully graduated scale of labor was planned and put into regular practice.

"The grades of work may be summarized as follows: (1) carrying baskets of mould or other material; (2) using a small shovel; (3) using a large shovel; (4) using a pickaxe; and (5) using a pickaxe for six hours a day. Patients in grades 1, 2, 3, and 4 work for four hours a day.

"When a patient has been on a grade of labor for about three weeks his fitness for harder work is considered. If the temperature has been normal, the weight is satisfactory, the appetite good, and if he is feeling well then he is put on harder work.

"Patients who have successfully worked for six hours a day are put to work at their trades three weeks before their discharge, in order that the muscles used in their particular work may become accustomed to it.

"The grades of exercise and work for the women are similar to those for the men, but on a smaller scale. They also keep in order their own part of the grounds, cultivate a small kitchen garden, and, in addition, they have charge of the poultry. The final grade corresponding to the hard navvy work of the men consists of scrubbing work indoors.

"The temperature is the danger signal in this course of treatment: any patient who has a temperature of 99° and is suffering from the slighest headache is immediately ordered to bed."

The selection of cases is made from the results of the examination on admission, when patients are divided into two groups: (*a*) those with early disease, *i. e.*, slight signs in one or two lobes; and (*b*) those with more extensive disease, *i. e.*, widespread infiltration of one lobe; or scattered infiltration in smaller but permanent foci in three or four lobes.

The general condition. At the examination special attention is given to the facial expression and to the general physical development. These points should always be considered together with the physical signs, as a patient with tubercle bacilli in his sputum may look very ill and have marked wasting and poor development, even though no physical signs of disease are found on examination of the chest. Such a patient is quite unfitted for much, if any, exercise such as may suit a patient with considerable signs.

Paterson has made the following observations: (1) Suitably selected

patients can be gradually trained to do the hardest navvy work for six hours a day, the result being that their general condition is much improved whilst some lose both their sputum and their tubercle bacilli. (2) Certain patients who do not improve on light work show marked improvement on harder work. (3) Patients who have slightly overexerted themselves and are kept at rest for the few following days are subsequently not only worse, but may be in their own opinion better.

The opsonic index proves an invaluable guide, saving perhaps months of time, by determining within a week that the patient is fit for the hardest work, when clinically we should hesitate to come to such a conclusion. Inman's work so far as it has gone, confirms the value of graduated manual labor in the treatment of pulmonary tuberculosis, and has done so in a manner that otherwise could only be determined by a further trial lasting over several years.

In conclusion, the combination of rest, pure air, and overfeeding is not the only treatment for chronic pulmonary tuberculosis. Graduated labor is a definite indication, and when indicated it can raise the general health and resisting power of the patients.

Passive Hyperemia of the Lungs and Tuberculosis.—Wilder Tileston's instructive paper endorses Rokitansky's view (1846) that these two conditions are antagonistic; and bases the following conclusions upon a study of the records of the Great Hospitals in Boston. The 180 cases of mitral stenosis showed at autopsy a much lower percentage of pulmonary tuberculosis than the material from which they were drawn. Those cases with a high degree of stenosis were more free from tuberculosis than those with a moderate stenosis, and were entirely exempt from active tuberculosis.

A person with mitral disease is less liable than others to acquire tuberculosis of the lungs, and if he does, the pulmonary disease usually runs a mild course, with a strong tendency toward cure.

This relative immunity is to be ascribed to passive hyperemia of the lungs consequent on the mitral lesion.

There is a possibility that artificially induced hyperemia of the lungs may be a valuable adjunct in the treatment of pulmonary tuberculosis.

Kuhn's Pulmonary Suction Mask[1] is best explained in Tileston's lucid description: "It consists of a light apparatus which fits in the nose and mouth, with an arrangement of valves by which inspiration, which is nasal, can be impeded to any desired amount. Expiration, on the contrary, is unobstructed and takes place either through the nose or the mouth. The effect of impeded inspiration is to produce negative pressure in the thorax, lasting almost throughout inspiration; the inspiratory muscles are brought into strong contraction, inspiration is prolonged,

[1] Munch. med. Woch., August 27, 1907, p. 1713 also Deutsch. med. Woch., September 13, 1906.

and the rate of respiration lowered. The most important effect, however, is the marked aspiration of blood from the right side of the heart into the lungs due to the prolonged negative pressure. The lungs are, therefore, supplied with an increased amount of blood. Moreover, since expiration is not obstructed, it will be short, and the blood will not have time to escape entirely to the left side of the heart. Thus, after wearing the mask for a while a considerable degree of congestion is obtained, as has been proved by animal experimentation.

"This hyperemia differs, of course, from the passive congestion of heart disease, in that there is no obstruction to the pulmonary circulation. The increased amount of blood in the lungs is of the greatest benefit, for it is conceded that it is the relatively poor supply of blood or lymph to the apices which predispose those parts to tuberculosis.

"As to the results obtained with Kuhn's mask, the following claims are made: Cough is allayed, dyspnea diminished, and a gain in weight almost invariably takes place. Most interesting is a marked increase in the number of red cells in the peripheral circulation, at first temporary, later permanent, and probably due, as in high altitudes, to the lowered pressure of the air in the lungs. Actual cure is claimed for favorable cases, but a more extensive trial will be necessary before a final opinion is reached."

The Induction of Artificial Hyperemia of the Apex. A. T. Tucker Wise,[1] the author of this new and important departure in practical treatment, was impressed by the intolerance for the dorsal decubitus in asthma and in all conditions which limit the free entry of air into the lungs, such as bronchitis, pneumonia, pleurisy, and pulmonary failure generally. He noticed, moreover, that where the dorsal posture was maintained for long periods, as in some surgical affections, hypostatic congestion was apt to arise in cases of slight cardiac weakness.

On the other hand, gravitation had been utilized to empty foul cavities of the lung, as in the morning "*toilette des poumons*," where the patient leans over the side of the bed for a few minutes and with a minimum of coughing effort evacuates the night's collection of mucopurulent matter, or in the passive mechanical inversion effected by Colin Campbell's "Revolving Chair."

Wise says: "Ewart's method, described in the *Lancet*, 1901, vol. ii, of treating bronchiectasis by keeping the foot of the bed raised and by partial inversions, has proved satisfactory. In children partial inversion is more easily carried out than in the adult. They usually swallow their phlegm; and if the process of expectoration could be assisted by any natural means it would be a distinct gain when decomposing toxic excretions had to be got rid of. I have devised a lying-out chair with an *allonge* which enables the occupant to assume

[1] Lancet, May 30, 1908.

the prone or forward position without discomfort. The special feature of the appliance is that, combined with the allonge, it forms for the patient a double inclined plane; and by this curvature of the body obviates excessive blood pressure in the cerebral vessels, as the lower extremities of the patient are not raised above the level of the head. In all other previous attempts to invert a patient congestion of the head had proved a great obstacle to maintaining the position for any length of time. As a beginning this inclined plane is employed on three occasions during the day, commencing with half-an-hour each time. Later on, when the patient becomes a little hab tuated to the novelty and more inured to the unaccustomed slope of the body, some hours may be spent in this position, either waking or sleeping, as, in addition to utilizing the force of gravitation for the drainage of corrupt accumulations in the lung, an important modification of the pulmonary circulation is brought about by the forward incline of the thorax. The apices of the lungs, now in a more dependent situation, have at once a fuller blood supply and some parts of the pulmonary tissue become relieved from the weight of the heart, which falls

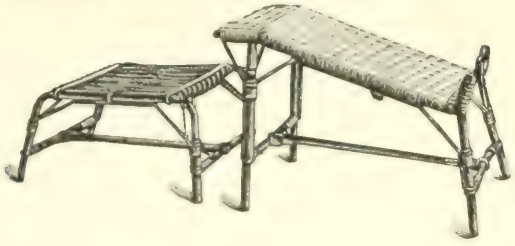


Fig. 1

forward to be supported by the sternum. Perhaps this slight alteration in the relations of the viscera is of less consequence than the increased diffusion of blood which, we may with reason conclude, has supervened in the upper and more confined parts of the lungs. This mechanical plethora will be at its limit some time after the prone position is assumed, when a partial re-adjustment of the circulation will subsequently ensue, influenced by the nervous centres which control the pulmonary vessels; and on the individual rising from the prone position the blood supply to the lungs and other organs will gradually resume its ordinary condition. This *ra et vicis* of blood surplusage or recurrent hyperemia (common to all organs) is, to the deteriorating apex, what takes place in the normal lung under conditions of rest, alternating with healthy plethora caused by vigorous muscular effort."

Inclined Plane with Allonge. "Hemorrhagic cases" are not lightly to be submitted to this treatment, but those are not excluded in whom an isolated hemoptysis has occurred. The "pronounced pneumonic type" of tubercle and "fluid in the pleura" are among the reservations which may perhaps have to be extended.

The time after meals should be avoided for fear of any interference with digestion. It is also a wise precaution not to rise abruptly from the inclined into the upright position, or giddiness might result.

The best attitude, after placing on the allonge a cushion for the knees and on the inclined plane a soft rug, is to lie flat on the epigastrium and sternum with the partial weight of the thorax supported by the arm, as in the illustration. This distribution of the weight of the thorax over a wide surface only limits respiration in a slight degree without embarrassing the act, and may perhaps prevent undue expansion of the damaged pulmonary tissue. During certain phases of the disease, this limitation is desirable—chiefly in feverish conditions—but later on the rest accorded in this way to the lung can be varied with expansion induced by graduated walks, arm movements, breathing exercises, and having recourse to the climatic effects of Alpine elevations.

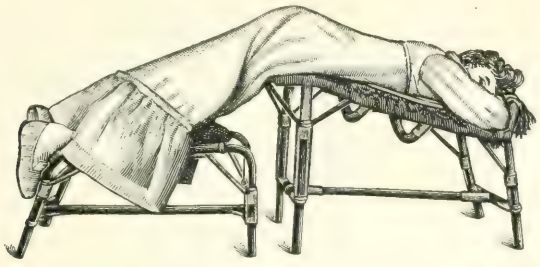


FIG. 2

In Alpine air during winter some patients aver that they feel warmer in the prone attitude and cough less. Large cavities are emptied with comparative ease, and apical crepitations have a tendency to recede after a short period. Concurrently there is a general improvement in the body temperature, the appetite, and the nutrition.

"The gratifying results attained in my own practice, by those who have persevered with the method, and the favorable reception given to it by some of my colleagues, move me to bring the question of 'posture' in the open-air treatment for further examination. In advocating the prone position for many early cases of pulmonary failure, in preference to the dorsal decubitus, which I regard as pernicious if persisted in for long, I do not suggest that all other means employed to combat the disease—rest and exercise, diet, and fresh air, sunlight, climate, and personal hygiene generally—are to be abated or relinquished.

"It has long been supposed that anemia of lung tissue encourages softening and caseation of tuberculous nodules, and the susceptibility of the apex has been explained on the ground of impaired circulation of blood and lymph in this narrow part of the lung. This theory gains support from the marked freedom from tuberculous disease in cases of

valvular derangements of the heart where the latter are accompanied by pulmonary congestion.

"The semisupine reclining attitude of the open-air cure is, of all customary sloping positions of the body, the most undesirable to further the easy evacuation of sputum from the lungs. The dorsal or supine slope of the thorax cannot but favor the extension of the disease from the apex of the lung to the back of the lower lobes by unintermitting gravitation. The common line of advance taken by the disease is actually seen to be in this direction. Better that the patient shifts his position from time to time than that any approach to the dorsal decubitus be maintained



FIG. 3.—The convalescent machine as a prone exerciser in the position for emphysema. For phthisis and for bronchiectasis the inclined plane is obtained by lowering the body support one or two holes at the front.

for a prolonged period of time. Even in those subjects who are taking gentle exercise the periods of called-for rest should not be forever spent on the weary backward incline."

These favorable results of the prone posture in phthisis are not surprising, as the advantages are cardiac as well as respiratory, the posterior lobes being allowed greater freedom, and this in itself easing the circulation. My own appliances for the prone posture[1] have been the "Infant-rest," the "All-fours' Exerciser," and the "Convalescent Machine," which provides many other uses.

[1] Constructed by Messrs. J. Ward, 246 Tottenham Court Road, W. C.

Owing to their adaptability to a variety of purposes and of ages, they are especially suitable for hospitals and institutions. Tucker Wise's prone couch has the advantage of greater simplicity and cheapness, whilst answering the individual requirements of the case of phthisis.

The systematic employment of the inclined prone posture is, I believe, an entirely new departure in the treatment of pulmonary tuberculosis. Judging from Tucker Wise's experience, it is likely to be a permanent addition to our therapeutic methods. My own previous use of that posture had been occasional only, and it was limited to an endeavor to empty the basic cavities of phthisis, and, on the other hand, to convey into cavities of the apex injections introduced through the trachea, an attempt which has since then been much more efficiently made by Colin Campbell by means of his ingenious "Revolving Chair." On the other hand, the continuous drainage of bronchiectatic cavities by the inclined prone posture was one of the special purposes for which the machines were devised and have been used.

The respiratory indications of the pulmonary rest-cure are thoroughly fulfilled by Tucker Wise's prone couch, as even during resting it favors the function of the posterior lobes. I must own, however, that the cardiopulmonary exercise cure, with local rest for the apices, provided by the prone posture on the convalescent machine, had been uppermost in my mind in connection with the sanatorium purposes of the machine. It was in that manner that I began using it last year for phthisis at St. George's Hospital. The graduated exercise which it provides can be strictly limited at first to the lower limbs, as the patient wheels himself about by the action of the feet; and the exertion can be started at a very low minimum of effort, as in the prone posture the weight of the body is entirely carried by the machine. For those who share these views as to the treatment of pulmonary disease Tucker Wise's most practical applicance might easily be modified and mounted upon wheels so as to answer the purposes of exercise as well as those of rest.

THE BRONCHI AND LUNGS.

The Physical Examinations of the Chest. An Aid to Inspection. The following suggestions, which we owe to K. Heberden Beall,[1] are worth noting by clinicians when looking for doubtful pulsations or swellings.

"Over the area under inspection there is drawn with a skin pencil a square plaid figure, the squares of which are from 1.5 to 2.5 cm. in diameter and from 12 to 50 in number, according to the size of the area being studied. Any slight movement of the skin at any point in such a marked area causes a change in the direction of some of the lines and a

[1] Jour. Amer. Med. Assoc., February 29, 1908.

distortion of the figure, and so renders visible movements of the internal organs which are not to be detected otherwise" (Fig. 4).

In one case a distended gall bladder, which gave no sign of its presence, was plainly visible at a distance of several feet when the plaid figure was drawn on the skin over it. To be convinced of the value of the procedure one has only to experiment with a cardiac impulse which is not, or is just barely, visible.

The Diagnosis of Incipient Tuberculosis. Among the aids to early diagnosis given by Albert Abrams[1] is the estimation of the methods for the diagnosis. "Whereas in health the lungs are resonant in inspiration, dull in forced expiration, and in emphysema the percussion note is the same in both phases of respiration, in tuberculosis pulmonary vesicular emphysema exists in the incipient and predisposed state, and can be identified by that test. Unchanged percussion resonance, hyperresonance, and prolonged expiration indicate deficient expiratory force

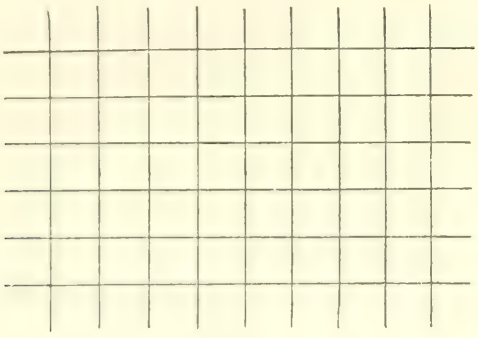


Fig. 4

and constitute the first signs of the pretuberculous stage. Vibrosuppression, that is elimination of vibration by pressure on the sternum, aids in obtaining proper percussion signs on the lungs. The author also describes the tracheal test and the use of the tuning-fork in testing conductivity of the lung substance.

"Pulmonary anemia, characterized by atelectatic zones in the lungs is an important sign. This form of anemia is not benefited by iron."

Tidal Percussion. Under this name R. W. Philip,[2] of Edinburgh, urges upon us for each of the boundaries of the lungs a comparative percussion during inspiration and expiration. The information to be derived from it is of the first importance in connection with the early diagnosis of *tuberculosis*, and with that view the apices are a special field for its employment. But the bases of the lungs are usually within the

[1] Medical Record, February 22, 1908; cf. Epitome British Medical Journal, April 18, 1908.

[2] Edinburgh Medical Journal, 1907, xxii, p. 473

scope of the method, and their cardiac and sternal borders likewise. As a fact, the method in question already forms part of the technique of the expert percussor. It is by means of this tidal percussion that we have been accustomed to gauge the extent of emphysema by the reduced range of tidal oscillation of the basic boundary of the pulmonary and hepatic percussion notes, and that we have ascertained the presence or absence of pleural or pericardial fixation at the left precordial boundary, etc., and conversely the range of respiratory mobility of the viscera, and particularly of the liver, the spleen, and the stomach. One of the most practical uses of the method is the determination of the *functional respiratory efficiency,* which is best conducted at the posterior base. In emphysema the line of the pulmonary resonance does not shift, and it is abnormally low; in abdominal plethora or ascites it is abnormally high and equally stationary. In active health it is as low as the upper border of the twelfth rib, but it can be made to undergo, with forced breathing, considerable oscillations.

At the apex too the same physiological testing of the pulmonary expansibility can be applied, but the conclusions have to be very carefully weighed, for reasons which I may proceed to explain.

At the extreme apex, owing to the anatomical conformation of the thorax, we cannot obtain the sharp profile percussion which is yielded by the other pulmonary borders, neither can we get hard down upon the face of the lung. Both in front and from the back the lung is cased in heavy bony and cartilaginous masses and beyond the reach of immediate percussion, which only becomes possible at the level of the first interspace. A great deal of this percussion is not immediate but pleximetric.

On the other hand, the extreme apex affords a unique opportunity for a top-surface percussion with little intervening covering to the lung, besides the skin and the dome of the pleura. Here again, however, we are dealing with exceptional conditions. Our vertical percussion of the supraclavicular fossa addresses itself, or may be made to address itself, to the entire column of air extending to the diaphragm and through the latter to the gas-containing abdominal viscera. Moreover, that column is pyramidal; and the deeper the level which our top percussion stroke may reach, so much the greater will be the resonance to be elicited by it. The points that we have to bear in mind are that in this broad and highly resonant column the apex proper occupies only a very small proportion, and that the percussion stroke will have to be exceedingly light that will not tap the underlying store of resonance. In short, top percussion of the apex is a matter requiring, for any reliable result, a combination of great delicacy, technical skill, and discrimination.

The factors influencing our top-percussion note as obtained over the apex itself also tell upon the indirect pleximetric percussion note which we obtain when we percuss the adjoining spine. A heavy percussion of the transverse process of the lower cervical vertebræ will elicit distant sono-

rous vibrations from the lower levels of the spinal column, and the resonant quality of the percussion note will vary with the degree of inspiratory inflation and of expiratory deflation of the lung lying in contact with the spine all the way down. We may therefore get much or little resonance according to the mode of our percussion. As regards the actual respiratory rise and fall of the apex itself, this pleximetric note yielded by the spine has been turned to account, and it enables us to map out and to record the result in millimeters of vertical displacement of the upper limit of spinal resonance, and to draw inferences from this as to the movement of the lung.

As a physiological estimation of efficiency this cervical spinal percussion is of value in comparing the two apices in the same individual. Even a slight and perhaps "latent" degree of lateral curvature will establish a difference between right and left; and this has always been a fertile source of mistaken diagnosis of pulmonary disease. When, however, we attempt to compare the value obtained in two individuals, we at once have to establish reservations as to the relative significance of the readings in millimeters.

The type of thoracic comformation is a major factor bearing upon the vertical respiratory rise and fall of this horizontal line of spinal resonance. It is obvious that the square-shouldered chest with almost horizontal ribs will command very much less inspiratory rise of the apex and of this line than the chest with sloping shoulders and slanting ribs, which may be very efficient, but on the other hand may be dangerously akin to the phthinoid type. It would be rash, then, to conclude, from the mere difference in the readings in millimeters, that the broader chest was the less efficient of the two.

In the light of these remarks it may be gathered that when we proceed to utilize apex percussions of the different kinds for the purposes of fine diagnosis, as, for instance, of the earliest changes and lesions of tuberculosis, or of the varying stages in healing or in deterioration in any given case, it is obvious that we shall need a very wide capacity for appreciation and a highly trained personal tactile and auscultatory experience of percussion to avoid serious mistakes. If we should possess these acquirements our percussion will probably be so finely modulated as not to be readily followed by our audience; and for them instinct will appear to constitute the best part of our technique.

The favorable account given of this method by Philip on the foundation of a wide clinical experience is a special recommendation for it, although we should be thankful for somewhat more definite evidence in support of the alleged high levels of the apex which are not commonly admitted by anatomists or clinicians. In this connection he says: "Exception has been taken to the statement that the lung reaches so high above the clavicle. It is contended that on postmortem examination the apex of the lung does not extend so high. Such contention, however, over-

looks the fact that the limits of the lung after death, and more particularly when the chest is opened, are not the same as the limits of the lung during respiration. As the result of many measurements of the apices of presumably healthy lungs by percussion, I am satisfied that one and one-half inches above the clavicle is rather below the mean elevation, and that frequently lung resonance may be traced to two inches above the clavicle and even higher."

In connection with the value of the method in prognosis, he remarks: "As disease becomes arrested, a considerable increase in degree and extent of resonance during full inspiration is frequently observed. Such return of ampler tidal resonance affords one of the most satisfactory indications of improvement. On the other hand, as the disease advances, the amount of tidal percussion difference is reduced still farther."

The Paravertebral Triangle of Dulness (Grocco's Sign). Smithies'[1] case of abdominal multilocular cystadenoma deserves some attention on its own merits, but its importance clinically is perhaps greater still in connection with the physical sign to which he alludes. In my earliest communication upon that subject to the *Lancet* I gave an account of a case in which the triangle of dulness was due to an abscess below the diaphragm and disappeared under my hands on the operating table as soon as the pus was evacuated by Sir William Bennett. Last year I also described a double paravertebral triangle as a new sign for the presence of fluid within the abdomen. The production of this sign by infradiaphragmatic collections of fluid is therefore an old-established fact. But Smithies' observation is novel and perhaps the first in which the fluid was contained within a tumor. From the figures it will be seen that the lines of the triangle were not in this case as sharp as those to which we are accustomed in pleuritic and ascitic effusions, and this is accounted for by the circumstance that the mass contained in the abdomen was of very great size. Its removal was followed by a complete disappearance of the dulness.

Beall,[2] who has contributed another case of *subphrenic abscess* on the right side where "there was an easily definable paravertebral triangle on the left," had previously suggested that the sign might occasionally be expected in other subphrenic conditions, such as tumors and cysts of the liver, abscesses, etc. His suggestion has been realized in this instance; and in the future we shall have to bear in mind, in cases presenting a triangle of small elevation and of broader base than usual, the possibility that the cause may be hypophrenic and, in the second place, that it may be not a fluid, but a solid formation.

Smithies makes the following remarks: "The cause of the paravertebral dulness in this case appears to be due primarily to the presence of the

[1] Journal of the American Medical Association, May 9, 1908.

[2] Ibid., December 28, 1907, p. 2148.

large, cystic, abdominal neoplasm. Just in what manner this new growth produced the changes in the thorax can only be conjectured.

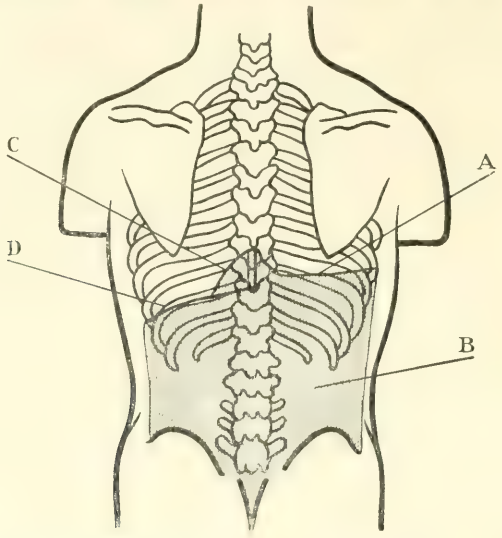


FIG. 5.—Outlines of percussion dulness. *A*, upper limit of liver; *B*, flatness in flanks and lumbosacral regions; *D*, lower border of thoracic resonance on left; *C*, paravertebral dulness, base 6.5 cm.; vertical spinal dulness, about 4.25 cm.

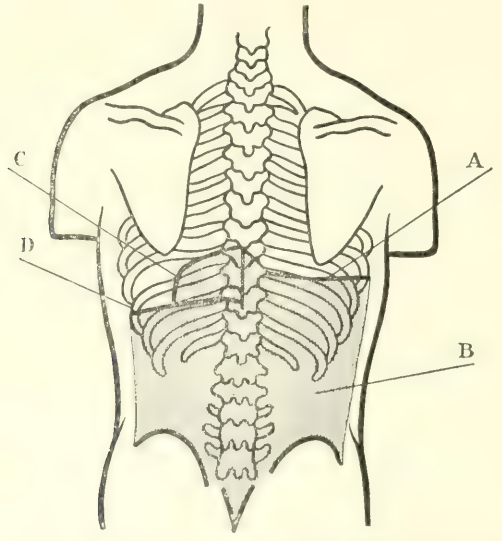


FIG. 6.—Outlines of percussion dulness one hour after tapping (11.5 liters fluid removed): *A*, upper limit of liver; *B*, flatness in flanks and lumbosacral region; *D*, lower limit of thoracic resonance; *C*, small triangular area of paravertebral dulness; base 2.5 cm.; vertical spinal dulness about 3 cm.

It would seem that in cases where paravertebral dulness exists from causes that are extrathoracic, something more than mere displacement

of the mediastinal tissues (as suggested by Baduel and Siciliano in explanation of Grocco's triangle) must take place. In the case herewith described the positions of the heart, liver, and spleen, together with the absent Litten's sign on both sides, certainly point, to a rather marked upward displacement o the diaphragm. It might be suggested that on account of the support offered the diaphragm by the liver on the right side, locally, the diaphragm was pushed upward to a greater extent to the left. In this manner one might fancy that some displacement of the mediastinal tissues took place, and that the lung on the left was pushed from the spine. One must not forget, however, that displacement upward and to the left of the liver itself could produce paravertebral dulness. The prompt disappearance of the dulness to the left, after extirpation of the tumor, enables one to rule out secondary growths in the mediastinal tissues or in the lung, and also speaks against the possibility of an unrecognized pleural effusion."

The real clinical importance in the case centres in the question of diagnosis. Smithies says: "This paravertebral triangular area of dulness appears to have a distinct value as a point in differential diagnosis between conditions of pulmonary consolidation, mediastinal growths, etc., and conditions associated with pleural effusion. It has even been suggested that the paravertebral triangle of dulness is pathognomonic of the ordinary type of pleural effusion. Recently, however, attention has been called to the fact that triangular areas of dulness may be percussed along the spine in affections where the thorax is not the seat of the pathological process. Ewart[1] now admits that in cases of ascites Grocco's sign may be present.

The Crucial Test. The case under discussion and the remarks bring out very clearly the fact that this sign, which is most reliable when thoroughly interpreted, is capable of misleading if not duly checked by the control experiment which I have introduced and described as "The Crucial Test." Hitherto little notice appears to have been taken of the essential importance of that test. It is of course vital to know whether a dulness is due to a simple serous effusion or to a pneumonia: a case recently under my care demonstrated the point at issue. Dulness and dry tubular breathing in the back coincided in a little child just admitted into the hospital with absence of any great distress or high temperature. A paravertebral triangle was found and the diagnosis made of pleural effusion. But the crucial test had unfortunately been omitted, and the diagnosis was wrong. After a few days the dulness and the triangle had disappeared after the evolution of the usual physical signs of a resolving pneumonia. Had the test been applied this error would have been avoided.

The importance of the matter warrants a repetition of the account which I have previously given in the *Lancet* and in Progressive Medi-

[1] Lancet, London, 1907, ii, 49, 189; ibid., ii, 112; Progressive Medicine, 1907, ix, 40.

CINE. The crucial test consists in causing the patient with suspected right effusion and with left triangle to turn on to his right side. Unless the collection of fluid be so great as to fill the pleura, this posture will cause the degree of the vertebral and of the paravertebral dulness on the left or uppermost side, to be perceptibly diminished (in small effusions they will disappear), but on sitting up again the patient will present precisely the same dulness as before. The counter-test is then to be carried out as follows. The patient is now made to lie down on his left side, the suspected effusion being this time uppermost. The vertebral dulness and the dull triangle on percussion in this position will present no diminution whatever, but rather an increase; and this is precisely what might have been expected, inasmuch as in this posture the fluid would gravitate toward the spine and convey to it as much dulness as its amount could convey. The shorter way is to perform the test and the counter-test by simply causing the patient to turn on one side and then on the other side, without sitting up. The alternate disappearance of the triangle and its reappearance, at the will of the observer, is conclusive (1) as to the dulness being due to fluid, and (2) as to the fluid being free. (3) Inasmuch as a serous effusion is most commonly free, and a purulent effusion most commonly not free, but confined by adhesions, it may further be inferred as probable that the effusion is of a serous nature. But the test does not profess to give any strict distinction; and evidence as to whether the free fluid is serous or purulent must therefore be sought elsewhere.

Bronchitis and Bronchial Affections. PERIBRONCHITIS, which occupies so large a place in pathology, is not even indexed in our clinical treatises. It is mentioned here only to say that it is not a condition capable of clinical demonstration. Yet we often know that it must be in progress. And we are also aware that it is not immaterial whether it be present or absent in a patient. In reality, it is an integral part of the structural changes of bronchitis. But there is a wide range of variation in the relative proportion of the peribronchitic and of the bronchitic changes. This variation is correlated not only with the special nature and irritating properties of the exciting cause, but much more with the relative vulnerability of the peribronchial tissues in the individual. Peribronchitis is for that reason a much greater danger as well as a much more obvious lesion in the bronchitis of children than in that of adults, in virtue of the lymphatic character of the peribronchial sheath and of the puerile vulnerability of all lymphatic structures, a vulnerability which reaches its climax in infants and children of the scrofulous constitution. Thus, whilst the clinical name is "bronchitis," the clinical trouble most often is "peribronchitis." Peribronchitis enters largely not only into the pathology of pulmonary tuberculosis in children, but also in that of the more acute infectious which are grouped under the name of Acute Bronchopneumonia. It may perhaps be said that the bronchial reasons why the bronchiolitis of adults should rarely, and the bronchiolitis of infants

should almost invariably, turn to bronchopneumonia are, on the one hand, the minuteness of the caliber and the delicacy of the inner lining of the infantile bronchiole, and on the other hand the extreme susceptibility and proliferative response of its lymphoid outer sheath, a conjunction which renders obstruction and consolidation almost inevitable.

Thus where we know that peribronchitis must be present, although its diagnosis may be in abeyance, it must be uppermost in our minds as a guide to our treatment. And our treatment is likely to be successful in saving infantile life in the measure in which we may succeed in controlling its intensity.

A unique case of *plastic bronchitis* has been reported by Samuel West,[1] that of a girl aged eleven years who had her first attack at the age of seven, and had had five attacks since then. During her seventh attack which came under clinical observation and which seems to have been unilateral, there developed extreme displacement of the heart and mediastinum toward the left, simulating the changes observed in pneumothorax. This displacement disappeared as the cast was expectorated, but recurred as each fresh cast formed. West takes the view that the collapse of the left lung was due to absorption of the alveolar air. Perhaps however, a greal deal of it may have been due to ball-valve action of the membrane, which may have allowed escape but no ingress of air.

Chronic Fibrinous Bronchitis. E. Burvill-Holmes' paper,[2] describing a case of the affection, takes up the study of the subject where it was left by Bettman's exhaustive paper of 1902,[3] analyzing the 100 cases published during the preceding thirty-two years. Since then the record is brought down by Burvill-Holmes as late as the end of 1907, with eleven additional cases which have been reported by Vassal, Rabé, Shoyer, Moser, Schwarzkoff, Deganello, Bosc, Bilina, Giglio and Dehon, and Brasser, and contributions to the subject have been made by Eisel, who enters upon the etiology of the disease, by Millian, and by Rabé, to all of which references are given.

Bettman classified his series of a hundred cases as follows: (1) Chronic bronchitis with expectoration of branching casts; (2) acute bronchitis with expectoration of branching casts; (3) cases in which branching casts were not expectorated but found at autopsy; (4) cases in which cast showed no dichotomous branching; (5) expectoration of casts in organic heart disease; (6) expectoration of casts in pulmonary tuberculosis; (7) cases of small and non-branching casts associated with asthma; and (8) formation of casts in bronchi in cases of pulmonary edema following thoracentesis. Burvill-Holmes would reckon his own case, that of a young woman aged twenty-six years, of only eight weeks' standing, either to group 1, viz., the expectoration of branching casts

[1] Lancet, February 15, 1908, vol. i, p. 489.

[2] New York Medical Journal, April 25, 1908.

[3] American Journal of the Medical Sciences, February, 1902.

associated with chronic bronchitis, or to group 6, cases associated with pulmonary tuberculosis. If to the latter, the case is interesting because in the cases recorded by Jaccoud, Model, Duflocq, and Ménétrier the expectoration of casts did not occur until late in the disease, and consequently with clinical symptoms well marked. Whereas in his patient, if tuberculosis existed at all, it was in its incipiency; and hence if it be the etiological factor in this case, the case is rare.

Comparing the case with those associated with chronic bronchitis, it presents one or two interesting features. Usually these cases exhibit marked dyspnea preceding the expectoration of the cast. This patient says that she never had dyspnea, and having none it is exceptional for the severe paroxysms of coughing which she suffered from, because observers have noted that in those cases in which dyspnea does not obtain little or no coughing is the rule. As is usual, the casts were always formed in the one place, as is evidenced by the patient's own appreciation of their location. The not uncommon symptom of emaciation and loss of strength was not present. No skin complications, such as pemphigus, impetigo, or herpes zoster, noted by many authors, had existed so far as ascertained.

Bronchiectasis. *Prognosis.* In spite of the great change in our treatment since the beginning of this century, impaction of foreign bodies and syphilitic and tuberculous strictures will continue to supply incurable cases. But our duty today is to diagnosticate the cases before they are hopeless and to study the methods which can arrest, if they may not cure, the disease in its earliest stages. A fresh prognosis is now in the making. But retrospective interest attaches to the prognosis that existed in the past. It is set forth in Dyke Acland's instructive paper:[1] "In the adult, bronchiectasis, when once fairly established, is, except in very rare instances, incurable by any method of treatment at present available. In some of the more acute cases in young persons cure may occasionally result. In chronic cases the distress of the condition can often be greatly relieved, and if the exciting cause of the disease is not progressive, life can frequently be prolonged."

But although this was hitherto denied by authorities, the writer considers that it is curable in children, in youths, and in young adults, the difficulty increasing with years and with duration; and that at later stages of life it is less and less likely to be cured, but still capable of arrest and of considerable improvement. Its curability entirely depends upon the treatment being adequate. Evidence will accrue on fair trial as to which of the late complications will prove to be unmanageable.

"*The Principles of Treatment.*"[2] To stop the symptoms is our first duty. The cure of the lung, which is the next, can only be secured by an expansion of the healthy lung tissue and by a fibrous contraction of the diseased tissue. The stages in our treatment are (*a*) the active stage of

[1] Practitioner, April, 1902.

[2] Read before the East Sussex Medico-chirurgical Society, March 23, 1908.

treatment, and (*b*) the continued stage of progress, which must inevitably extend over a long period.

For the catarrh and the expectoration an emetic is, so to say, the bronchial purge, whilst a short course of expectorants is the bronchial laxative. But the most effectual method as regards evacuation is the postural—the ultra-prone or inversion method for children, and for all ages the prone method.

The Postural Treatment. (*A*) *The Intermittent Method.* H. Quincke, of Kiel, was the first to suggest the systematic use of the inclined prone posture, but he advocated its employment only for short periods in the day.

(*B*) *The Continuous or "Empty Bronchus" Method.* Although, as stated on p. 81 of the first edition of Volume V of Clifford Allbutt's *System of Medicine* (published in 1898 rather earlier than Quincke's article), my previous treatment had included the systematic emptying of the chest by bending forward, or by lowering the head over the edge of the bed, I had not until 1901 realized as absolutely indispensable

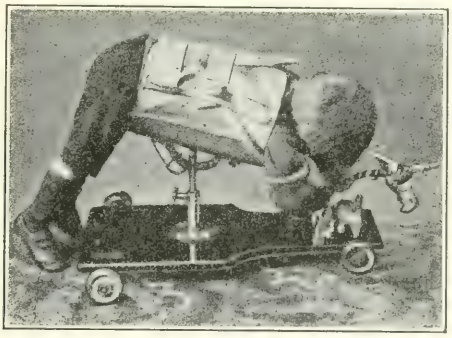


Fig. 7.—The all-fours' exerciser arranged for the inclined prone position for bronchiectasis or phthisis.

the application in bronchiectasis of a principle which guides me in all reconstructive treatment for chronic affections, that of unfailing continuity in the preventive and in the active measures. This meant not only to empty the chest by the prone postural movements mentioned, but to keep the chest permanently empty without any possibility of re-accumulations, particularly during the night. This could be carried out by the "slanted bed" for the night; and during the day by the use of the "all-fours' exerciser" for children and of the "convalescent machine" for older patients.

Both machines have for their purpose to promote not only bronchial drainage, but pulmonary expansion by exercise.[1]

The same respiratory purpose is also to be served by the "Elastic

[1] From the Medical Press and Circular, May 20, 1908.

Jacket," and by the "Costo-abdominal Elastic Belt," which Rose described in connection with the treatment of emphysema.

The limitations in the results derivable from these passive measures must vary in different subjects. A section through the tunnelled fibrous tissue of an old lesion shows that no posture could drain equally well all the channels and sacculations; although, as they belong to a continuous branching system, they must all be more or less benefited. Thoroughness demands more active methods than mere gravitation to empty, to wash out, and to disinfect the more remote recesses. The existence of fetor renders these measures indispensable. Apart from the latter they are a suitable beginning to the early and more active stage of treatment; and when progress is accidentally interrupted, or some complication leads to a recrudescence, their renewal should not be delayed.

Of the various modes of treatment which have been in use, and which can be pursued in conjunction with the postural treatment with increased efficiency and advantage, the most important are the following: (1) *The Intratracheal Injection Method,* for the direct medicinal treatment of the cavities; (2) Arnold Chaplain's well-known *Creosote Inhalation Method;* (3) The administration of *Internal Remedies,* of which there is a great number, none of them unfortunately curative; and (4) *The Ordinary Inhalations,* which are also very numerous and for which a variety of appliances are available.

The Treatment of Bronchiectasis by Intratracheal Injections. Intratracheal injections of menthol and olive oil through the glottis for the treatment of pulmonary and laryngeal phthisis were first practised by A. Rosenberg, of Vienna,[1] in 1885. His method was tried in Scotland by Jamieson, Downie, Byrom Bramwell (1889), Sir T. Grainger Stewart (1893), and others. Since 1893 it has been extensively practised and elaborated by Colin Campbell, and in its present form may be spoken of as his method.

The experimental data were worked out in 1886 by Sehrwald[2] by means of percutaneous intratracheal injections in dogs; and by Reichert.

Reichert's experiments, made on calves and sheep, proved that the fluid injected found its way even into the finest bronchioles.

Sehrwald's conclusions were:

1. That large quantities of fluid can be injected without discomfort.

2. That the fluids not only pass into the alveoli, permeating the surrounding tissues, but also reach the peribronchial and pleural fibrous structures, and even penetrate the cartilages themselves.

3. That the lungs absorb more rapidly than the digestive tract, or even the subcutaneous tissue; the rapidity of absorption corresponding with the extent of the absorbing surface; so much so, indeed, that the lung of a dog can absorb four times its own weight in less than five days.

[1] Berliner klinische Wochenschrift, 1885 and 1887.

[2] Practitioner, vol. xxxvii, 1886.

4. That medicines thus introduced act in smaller doses, and more rapidly, than when introduced in any other way.

Colin Campbell's earliest improvement consisted in substituting Price's distilled glycerin for olive oil, as the latter neither dissolves, nor mixes with the mucous secretions, and is not so good an expectorant. Other glycerins were too irritating for use. Menthol (8 to 12 per cent.) as an anesthetic and antibacillary remedy, and guaiacol (2 to 4 per cent.) he continued to use after trying various substitutes, such as benzosol, turpentine, terebene. More recently he has employed izal.

As to the bulk of the injection, he finds it best generally to empty a syringe holding about 100 minims at each squirt, and to repeat this 100 minims two or three times at each sitting. But as much as 4 or even 6 drams have been injected; or a total of 3 ounces in one day.

The Technique. 1. Skill is to be acquired by practice. The manipulation cannot be given in detail. Campbell recommends that the tube should be rapidly passed into the larynx, and should fit the curve of the base of the tongue and lie tightly against it, thus fixing the epiglottis and preventing spasm. The squirt should be delivered like lightning, either with inspiration or during a slightly prolonged interval following expiration. If the operation be properly performed, the taste of the fluid injected should not be perceived by the patient. The patient learns to hold the tongue, and the operator to introduce the syringe without a laryngeal reflector.

An essential is that the patient should sit or stand perfectly straight, although in cases other than those of general bronchitis ar asthma the purpose is to reach some definite region of one or both lungs.

If the operation be properly performed, avoiding the three mistakes of (1) touching the fauces, base of tongue, epiglottis or rima glottidis with the nozzle of the syringe; (2) squirting down the esophagus; (3) squirting during expiration; there is neither asphyxia, pain, nor even cough.

The first mistake would occasion retching; the second gastric pain, with unpleasant eructations from the remedies used; the third a feeling of suffocation, causing the fluid to be returned into the mouth. These unpleasant results can best be avoided by great care in passing the tube through the mouth and fauces.

2. The postural factor has been elaborated by Colin Campbell into the use of an ingenious machine, "The Revolving Chair," which is described and figured in *The British Medical Journal*, December 19, 1903.

Recent Pulmonary Surgery has not achieved much for bronchiectasis. Schmidt's[1] attempts with the "Compression Therapy" of Forlanini and Murphy in eight cases were unfortunately quite negative, no air passing into the pleura. The other five cases did badly. But he was more

[1] Münch. med. Woch., December 3, 1907.

successful in three cases of inhalation pneumonia, or fetid bronchitis. W. Korte[1] has had only four recoveries in 15 pneumonotomies, and he regards the disease as usually too severe and too widespread for successful interference.

Asthma. *The Mechanism of the Paroxysm of Asthma* is nowadays almost universally regarded as of the nature of a bronchial spasm. Goldscheider,[2] who furnishes us with the latest review of the subject, is also of that opinion, and is not inclined to attach so much etiological importance to the catarrh. He believes that the main responsibility for the attacks rests with the nervous system; this is indeed the only conclusion to be drawn from the suddenness of the onset and from the influence of pyschical stimuli. As regards the subjective feeling of air-hunger, he agrees with J. Gad in attributing it rather to the laborious struggle of respiration than to its imperfect gas interchange, or to the accumulation of carbonic acid gas in the blood. Moreover, the subjective air-hunger is apt to be intensified by psychical impressions. He therefore lays great stress upon the psychical and nervous aspects of treatment, which are eminently an individual question, each asthmatic being a law to himself; whilst not overlooking the fact that there is enough evidence of some definite objective impediment to the respiration. He suggests that the patient should study to "put up with his air-hunger," and endeavor to regulate the relative duration of inspiration and of expiration, and that he must also learn to suppress his cough.

The Re-education of Breathing undoubtedly forms an important part of the modern and more rational treatment of the affection. For its success there is need not only of special experience and of special gifts in the teacher, but also of single-minded perseverance and willingness on the part of the patient.

The Treatment of the Paroxysm of Asthma remains where we had left it. Goldscheider has practically no fresh suggestions to make beyond the popular powders for fumigation, oxygen inhalation, the hot-air baths recommended by Goldschmidt, or vapor baths; and in the shape of internal medication, atropine and iodide of potassium.

As Regards the Treatment of the Liability, Goldscheider urges above all to work at overcoming the irritable weakness of the nervous system. He believes that hydrotherapy offers the best chance, and is also an excellent training against the liability to catarrh which may so seriously complicate the affection. He is also a believer in the climatic advantages of sea air and forest air, and of altitude, particularly the latter.

The Treatment of Bronchitis. For chronic bronchitis A. G. Auld[3] lays stress upon the value of three drugs noted for their stimulating

[1] Medical Society of Berlin, March, 1908.

[2] Ztschrift. f. Aerzt. Fortbild., 1907, Nr. 23; cf. Fortschrift. d. Med., 1908, Nr. 2, p. 46.

[3] British Medical Journal, February 15, 1908.

action upon glands and epithelium—iodide of potassium, turpentine, and balsam of Peru. He recommends to begin the treatment with the iodide, which establishes a free and easy expectoration, and to follow up this remedy with a steady course of the balsam. The value of turpentine as a liniment is not limited to its stimulating effect upon the skin. The patient inhales some of the vapor volatilized by the heat of the body.

In the early stages of acute bronchitis and bronchopneumonia Eustace Smith[1] prescribes that many-sided but neglected neurovascular, hepatic, glandular, and bronchial remedy, *antimony*.

Intranasal disinfection has quite recently been recommended by Marfan[2] for infective cases of bronchitis. He uses for instillation into the nostrils a few drops of mentholized almond oil. I long ago published this method, which has been for years *de rigueur* in all my cases of diphtheria, of zymotics affecting the upper respiratory tract, of pyrexial desiccation of the upper passages, of spasmodic and single bronchitis, and above all of whooping-cough. Only I use twice or three times daily olive oil flavored with jasmin (about 15 drops slowly into each nostril whilst the head is thrown back behind the bolster), and no disinfectant, the object being merely to cleanse, protect, and soothe the membrane whilst discouraging bacterial growth.

In *pertussis*, "to obviate bronchopneumonia and to cause the paroxysms to disappear within a week," Tissier[3] has used, in 117 cases during the last four years, a saturated watery solution containing 2.8 per cent. of fluoroform. He begins with one drop after each paroxysm, two drops on the second day, three on the third, and so forth, not exceeding 100 drops daily for infants under two years, or 150 for those under four years. Adolescents may take one-half ounce daily, adults 1 ounce or more. No gastric complications arise.

The Bronchiolitis of Infants and Small Children, which too often turns to bronchopneumonia, has been one of the therapeutist's sorrows; for the treatment has yet to be discovered which would cure it. This had been W. J. Penfold's[4] experience until he prescribed the iodide of potassium mixture, of which the following is the formula for a child one year old:

℞—Potassii iodidi . . . . . gr. vij
Paraldehyde . . . . . ♏ xij
Ext. glycyrrh. liq. . . . . ʒj
Aquæ . . . . . ad ʒij—M.
Sig.—ʒj every four hours.

Since then he has treated about 50 cases with great success and without any death, the secretions drying up in a remarkably short time where the routine expectorants had been useless and belladonna distinctly harmful.

[1] British Medical Journal February 29, 1908.
[2] Journ. de Méd. de Bruxelles, February, 1908.
[3] Journ. de Pharm. et de Chir., cf. New York Medical Journal, March 28, 1908.
[4] British Medical Journal, February 1, 1908.

Commenting upon these statements, "J. A."[1] confirms the praise given to iodide of potassium, but fails to understand the purpose of the paraldehyde. He doubts whether the 50 cases could all have been "bronchopneumonia." This is a disease of some duration, and "J. A." believes that stimulation becomes requisite either in the shape of an alcoholic beverage or of a mixture such as this:

℞—Tinct. strophanthi	♏ vij
Liq. strychninæ	♏ iv
Spt. ætheris	♏ xx
Syr. aurantii	q. s.
Aq. chloroformi	℥j—M.

Sig.—℥j every four hours for a child 1 year old.

Acute Leukocytic Pleuropneumonia, with Extensive Fibrinous Plugs. The unique description given by G. Carpenter[2] of the changes found in the right lung of an infant aged nine months, after an acute illness of three days' duration, may lead to the publication of analogous pathological observations in this novel direction. The naked-eye appearances were not unlike those of a bronchiolectasis; and on the other hand tuberculosis had been diagnosticated at first sight by another observer; but neither of these conditions was present. Carpenter's first impression was that of "a fibrinous extension up the bronchial tubes of an ordinary fibrinous pneumonia," but this proved to be wrong.

The right upper lobe was solid, partly red and partly pale, and was covered with a thick deposit of yellowish-white lymph. Numerous yellowish-white areas were scattered over the cut surface, looking much like follicular stomatitis, as shown in the accompanying drawing. Some of the lesions were finely branched, and could be pulled out, exposing little pits without any obvious walls, often pear-shaped depressions in the solid lung. When looked at more closely these pits or depressions in which the branch-like plugs were seated, displayed very thin opaque walls.

Under a high power these areas were found to be fibrinous, with white corpuscles in the meshes of the fibrin. In some parts they appeared to be chiefly or wholly cellular, and in others the fibrin predominated. They were contained in channels, the thickness of whose walls was merely that of the endothelium of which they were constructed. In a few of the plugs a red blood-corpuscle could be seen only here and there. These lymph-plugged channels appeared to be dilated lymphatics which had become invaded by the same material as that which covered the inflamed pleura. The endothelial walls showed no signs of proliferation or of inflammation.

[1] British Medical Journal, February 29, 1908 (last page).

[2] Reports of the Society for Study of Diseases in Children, 1907–08, vol. viii. Exhibited May 20, 1908.

"The lung itself is consolidated and the alveoli are filled with cellular contents. In a few places fibrin can be seen along with the cells, but the predominant change is cellular leukocytal mainly.

"Some of the bronchi contain cellular plugs similar to those within the alveoli. Other bronchi have shed their epithelium, which is seen curled up in the lumen of the tube along with the cellular elements. Fibrin is seen but seldom. In a few places there appeared to be a slight

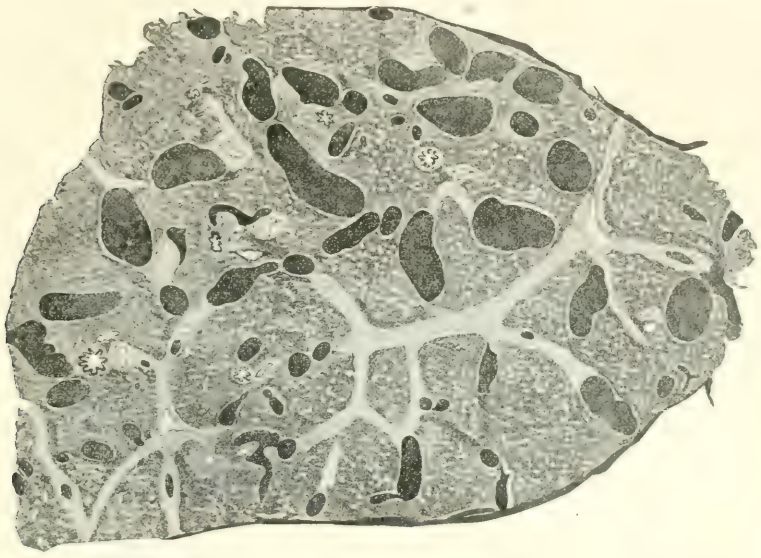


FIG. 8.—Microscopic section of the lungs magnified about 10 diameters.

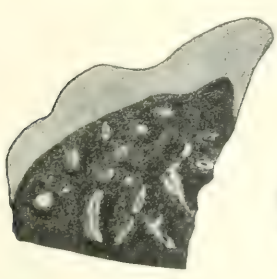


FIG. 9.—From a *pale part* of the consolidation.

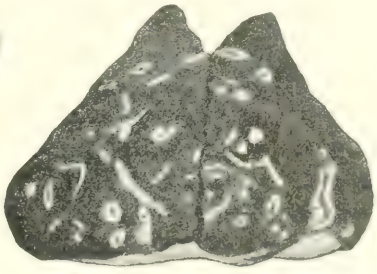


FIG. 10.—From a *red part* of the consolidation.

exudate between the desquamated epithelium and the basement membrane, but this is unusual. The walls of the bronchi in some cases are infiltrated with cells. Nothing abnormal can be seen in the arteries. Some of the dilated lymphatics are closely associated with them, but in no case is envelopment complete. The sections stained by Gram's method show numerous capsuled diplococci, which occur in the lung proper, the

plugs in the lymphatics, and in the exudation of the pleura. A section stained for tubercle bacilli yielded negative results."

Pulmonary Complications following Anesthesia. The latest contribution on this subject is from O. B. Wight.[1] They include, as is well known, pleurisy, as well as both forms of pneumonia, in addition to bronchitis. There is little doubt that congestion, both mechanical and induced by stimulations, occupies a large place in the causation of all these conditions, and in particular of the pneumonias—and that some of the latter may be of the nature of pneumonic congestions rather than of fully developed pulmonitis. Wight, indeed, calls attention to the shorter duration of the pneumonic attacks, to the usual absence of a true crisis, to the central type with late development of physical signs, to the mildness of the symptom of cough, to the frequent absence of blood in the sputum, and to the less frequent occurrence of complications.

All these features are compatible with a view that the affection is not of a typically genuine type, but made up of a bronchial congestive factor which is more evanescent and of a pulmonary congestive factor which is more enduring and may proceed to consolidation. A somewhat mixed result is of course to be expected from the conjunction of the various influences which are at work, and which must each of them be allowed a share in it. No satisfactory theory can be reared on the limited consideration of one or two of them only, but we should bear in mind the entire series which he enumerates.

The etiological factors are: (1) The irritant action of the anesthetic, ether being the most irritant, chloroform the least. (2) The hypersecretion of mucus, and the aspiration of mucus and vomit. (3) The possible occurrence of emboli. (4) The toxic effect of the anesthetic on the heart and bloodvessels, chloroform being the most dangerous. (5) The presence of pneumococci and other bacteria in the mouth and throat. (6) The extension of infection through subdiaphragmatic space. (7) In abdominal cases the cooling of the body: a loss of temperature from half to one degree may follow prolonged anesthesia without any other factor but that of the paralyzing action upon the nervous system, but various external and more or less accidental and sometimes preventable influences have to be remembered, such as a cold table, wet towels about the site of incision, irrigating solution and other conditions. (8) The limitation of the expansion of the lung. (9) The lessened resistance of the patient. Such are the chief, but not perhaps the only risks which a patient under deep anesthesia has to face.

Wight's recommendations for prevention include disinfection of the mouth and nose as a routine measure and the administration of the anesthetic by the open drop method with the head low and to the one side and the jaw kept forward. The elementary precautions for keeping the

[1] Bulletin of Johns Hopkins Hospital, March, 1908.

patient warm whilst on the operating table and during removal to bed should be given the utmost attention. For my part, in view of the severe irritation to which the upper air passages have been submitted during a protracted administration of ether, I consider that the toilet of the mucous membrane should include, as soon as the patient is transferred to bed, the slow instillation into the right and into the left nostril of about 30 drops of sweet oil, of which jasmine oil is a pleasant variety. Whether this might not with advantage be adopted as a routine procedure at an early stage of the administration is a question for anesthetists to decide. In addition to the protecting and cleansing effect, the soothing influence upon the mucous membrane is manifest. I have long used it and recommended it in a variety of irritative bronchial conditions and in all infectious affections of the upper respiratory tract.

The Acute Suffocative Catarrh of Laennec. Samuel West's[1] paper is largely analytical. It is an attempt to resolve the mysterious group of the acute pulmonary edemas into some nosological order by contrasting Laennec's description and that of his own case with the other varieties which are he believes rather symptomatic than independent types.

Among these varieties should be classed: (1) Cases of acute pulmonary edema which develop in the course of chronic heart obstruction or of acute heart failure; (2) cases of collateral fluxion or of pulmonary failure; and (3) cases of pneumonia which commence with widespread pulmonary congestion. A careful bacteriological examination of the sputum should be made in all cases of suffocative catarrh as being likely to throw light upon the true nature of the affection.

The special affections from which the suffocative catarrh of Laennec must be distinguished clinically are the following forms of bronchitis and of bronchopneumonia:

The acute bacterial, possibly pneumococcal or other bronchitis, and the common capillary bronchitis. And, on the other hand, the primary bronchopneumonia or disseminated pneumococcal pneumonia, and the secondary disseminated postbronchitic bronchopneumonia. Of these, the less difficult set to diagnosis would be the common capillary bronchitis and the secondary bronchopneumonia; the more likely to be mistaken for it would be the more fulminant forms of bacterial bronchitis or of primary bronchopneumonia.

In acute lobar pneumonia itself there is sometimes an initial acute diffuse congestion with alarming dyspnea which, ultimately, if not fatal, settles down to the ordinary course of pneumonia. This condition would be at first difficult to discriminate from Laennec's suffocative catarrh.

The group of collateral fluxion with respiratory failure, such as the rapid implication of the sound lung in a case of pleural effusion, or of

[1] Lancet, May 23, 1908.

both lungs in a case of ascites, etc., is a much less likely source of diagnostic error. The same is also true of one section of the following group.

The group of acute suffocative pulmonary edema from sudden cardiac failure contains cases without any antecedent heart symptoms, as in an instance of rheumatic hyperexia which West describes; and also cases in which valvular disease existed and the acute symptoms arose as a complication.

It is in this group of sudden cardiac failure that, according to West, are to be classed the remarkable cases described by G. Lindsay Steven[1] and Thomas Lissaman,[2] and also some other cases published in the *Lancet* that year, and more recently during the year 1907.

Laennec's original description ran as follows: "The disease is an acute catarrh affecting the whole or a very large portion of the mucous membrane of the lungs. The duration is from twenty-four to forty-eight hours, or at the most some days. At the end of that time either the patient dies or expectoration commences and puts an end to the suffocation, and the disorder then follows the course of a simple acute catarrh.

"While the suffocation lasts there is but little cough, and the expectoration, if any, is altogether pituitous or fluid. It retains this character for some days at least and then becomes more abundant; recovery sometimes takes place without its ever becoming properly mucous, in which case the disease is only a variety of the acute bronchial phlegmorrhagy or pituitous catarrh. When, on the other hand, the expectoration become mucous, the disease is simply an ordinary acute catarrh, in which the suffocative character of the invasion is caused by the extent of tumefaction of the bronchial membrane and by the large quantity of fluid excreted at once."

Laennec further states that it is very rare in adults, and for this reason had escaped the attention of physicians. In fatal cases the necropsy shows little morbid change. The lungs are somewhat congested and the tubes contain more or less (often only a very small amount) of frothy fluid. Laennec's opinion seems to be the correct one, that the urgent symptoms are due to the rapid tumefaction of the mucous membrane of the medium and small sized bronchi.

It is interesting to remember that similar symptoms may arise as the result of the inhalation of violently irritant vapors such as bromine and iodine.

Samuel West's case is headed "Acute Suffocative Catarrh," associated with peculiar bacilli of indefinite nature (diphtheroid), occurring in a strong young man, aged twenty-three years, who was quite well thirty-six hours before, when tightness at the chest began. He was admitted in a

[1] Lancet, January 11, 1902; cf. PROGRESSIVE MEDICINE, September, 1902.
[2] Lancet, February 8, 1902.

state of extreme dyspnea with cyanosis. Under treatment he rallied and ultimately recovered.

The clinical condition was altogether unlike that of pneumonia, nor was it or the respiration like that of asthma. There was no laryngeal or tracheal obstruction. The case suggested most that form of acute miliary tuberculosis in which the lung is stuffed with tiny tubercles and where the physical signs bear no relation to the general distress and dyspnea. Such a diagnosis, however, was not consistent with the history obtained of the attack in the present case.

The case recorded tallies in all points with Laennec's description. The only new fact is its association with the peculiar diphtheroid bacilli. As similar cases occur in association with the pneumococcus, the question may fairly be raised whether the acute symptoms do not depend upon the bacilli and their wide dissemination through the bronchial tubes.

In the Epileptic Seizure, Acute Pulmonary Edema, of which the familiar frothing at the mouth is the outward sign, is found by W. T. Shanahan[1] to be part of the syndrome in the cases which he has observed. He adheres to Welch's theory of a disproportionately depressed left ventricular action being answerable for the edema. His recommendations are to drain the bronchi by posture, to dry cup, to inject atropine and strychnine, and if necessary to perform venesection.

Emphysema.—The greatest innovation which has occurred during the past year in the domain of thoracic diseases relates to emphysema, which, like so many of our other once purely medical diseases, has now entered upon a surgical career. Wilhelm Alexander Freund's latest paper,[2] "Contributions to the Treatment of Phthisis Pulmonalis of the Apex, and of Alveolar Emphysema, by Operative Mobilization of the Stenosed Upper Aperture and of the Rigid Dilatation of the Thorax," is likely to be if possible still more historical than the papers which he first published nearly fifty years ago: "Contributions to the Histology of the Costal Cartilages in their Normal and in their Pathological States" (Breslau. 1858), and "Connection between Certain Pulmonary Affections and Primary Anomalies of the Costal Cartilages" (Erlanger, 1859).

His early investigations led him to the conclusion that the costal cartilages were liable to a primary degeneration ending in calcification, a change not strictly senile, as it was not limited to those of mature years that this degeneration was associated with a raised position of the ribs; and that pulmonary emphysema was the result. On that assumption it was only rational to turn for a cure of the emphysema to some practical attempt at restoring the ribs to their lost mobility and to their natural

[1] New York Medical Journal, January 11, 1908.

[2] Münch. med. Woch., November 26, 1907, p. 2369.

position. But it was only after a renewed appeal to surgeons in 1906 that his original suggestion was carried out and that chondrotomy was performed with a view to the formation of a false joint. The unilateral operation which was practised in the first case gave very good immediate results; but as the symptoms recurred after a few weeks the cartilages of the other side were treated in the same way; and this proved to be permanently successful. Since then three other successful operations have been performed in Germany.

The significance of these developments is plain; although a large proportion of the failure to relieve emphysema might, I think, have been avoided by increased thoroughness in clinical study and in practical treatment. Whilst operative surgery may encroach by degrees, a good deal of the ground will have to be won back by persevering therapeutical efforts. The domain of "Emphysema" is henceforth a joint possession of Medicine and of Surgery, and we must define as clearly as our methods will permit the strictly surgical province.

Professor Friedrich A. Hoffmann, in Nothnagel's *System* has reviewed the previous theories, and is inclined to regard emphysema as capable of resulting from a variety of pulmonary conditions, but as being usually the result of chronic catarrh of the lung.

A primary thoracic affection is also conceivable, and its existence was long ago insisted upon by Freund; but his views have only recently gained ground. The calcification of the costal cartilages which he describes is chiefly witnessed in elderly subjects, and Mohr regards it as the mode of production of the senile form of emphysema. But Freund has observed it also in younger and even in juvenile subjects; only the type of lesion is different. This peculiar change in the cartilages,which may be unilateral or bilateral, and consists in a thickening, enlarging, and lifting of the cartilages, the substance of which undergoes fibrillation and finally in duration and calcification together with a remarkable change to a dirty yellow color. This discoloration affects the outer zone, underlying which are seen on section a whitish middle zone, and a dirty gray inner zone. The consistence becomes hard, stiff, and brittle.

At the same time there occurs the peculiar progressive development of the thorax described by Freund. As the enlargement beginning at the second and third extends to the other cartilages of one or of both sides, the respiratory attitude undergoes an alteration. As long ago stated by Dupuytren, "All calcifying costal cartilages assume the inspiratory position;" and eventually the "rigid dilated barrel-shaped thorax" results. At its broadened lower aperture the dome of the diaphragm is flattened out by stretching, until its fibers undergo in varying measure the degenerative changes of brown atrophy and of fatty granular decay.

The effect of this alteration of the thorax upon the lungs has been studied recently by Freund,[1] who points out that the lung possesses no

[1] Ztsch. f. Exper. Path. und Ther., 1905, Bd. iii, p. 479-498.

chest-dilating power of its own, and could not be instrumental in keeping the thorax permanently expanded, except only when the egress of air was hindered by some ball-valve-like obstacle, or when an exaggerated intake of air was kept up as it is apt to be in sustained cough, as in chronic pulmonary catarrh. False impressions and false interpretations have prevailed as regards an alleged prevalence of *occupation-emphysema* in artisans and musicians, such as glassblowers and wind-instrument players. Mohr's statement that these occupations do not predispose to emphysema more than others is based upon the statements and the evidence of Freund,[1] of Prettin and Leibkind,[2] and of Fischer.[3]

The importance of finding some means of differentiating between the two conditions described as the *primary pulmonary*, and the *primary thoracic emphysema* lies in the fact that in one of them Freund had long advocated active treatment, whereas the treatment of the other has remained expectant or palliative only. In the one case the lung could resume function if set free; in the other case where the thoracic stiffening was only secondary to pulmonary degeneration the lung could make little use of the opportunities of a renewed thoracic mobility.

The identification of the primary, thoracic, rigid dilatation is to be based upon (1) the clinical history showing an absence of nervous asthma and of relapsing catarrh (due regard being paid to the fact that emphysema itself will later on favor the liability to catarrh, and to attacks of dyspnea readily mistaken for asthma); (2) the characteristic misshapen look and feel of the costal cartilages; (3) the predominance of the emphysema at the anterior fringes; and (4) the position and behavior of the diaphragm as seen through the screen.

The operation proposed by Freund was first performed by O. Hildebrand, of Berlin, and reported by him.[4] The eventual result was considerable improvement in the subjective symptoms, and in the respiratory efficiency, the vital capacity having almost doubled. The second case, reported in Mohr's paper, was that of von Bramann. Freund's procedure was somewhat modified by resecting a little of the cartilage and of the adjoining rib, in a patient aged forty-six years, a "Gläsermeister." One month after his discharge the symptoms recurred and he begged for the performance of the same operation on the left side. This was carried out by von Bramann with most gratifying success. Greatly increased mobility of the thorax was the immediate result; and the dyspnea and catarrh were remarkably improved.

On the strength of this case, in which medication and hydrotherapy had proved of comparatively little use, Mohr strongly recommends the adoption of this safe and harmless method of relief in all cases where emphysema is dependent upon a rigid dilatation of the thorax.

[1] Loc. cit.
[2] Münch. med. Woch., 1904, No. 6.
[3] Ibid., 1902, No. 17.
[4] Ibid., 1906, p. 484.

The third operation was performed by H. Passler and H. Seidel[1] and included a division of the first costal cartilage as well as a resecting of the second, third, fourth, and fifth cartilages on one side of the chest. A fourth case was operated on by A. Stieda.[2] For the first time, in this case, the bilateral operation was performed at once. As the results in all these cases proved satisfactory, although the first cartilage was not divided except in Seidel's patient, Stieda thinks that this is an unnecessary complication of the surgical procedure; and he recommends that it should be reserved for the relief of the condition described by Freund as "Stenosis of the Upper Aperture," as responsible for the liability of the apex to tuberculosis.

He wisely urges that if the advantage of the operation is to be secured the operation should not be postponed indefinitely, lest the growing cardiac dilatation and visceral congestion should prove too great a handicap.

The non-surgical treatment was dealt with by me at the London Polyclinic, May 12, 1908, after some introductory remarks on the "Natural History of the Elastic Function and Tissue," and on "Factitious Emphysema." Hitherto our treatment has begun too late, and has been too much restricted to the symptoms of catarrh. The causal treatment is mainly respiratory, and often needs to be begun in childhood. A thoroughly ample and adequate supply of rarefied and of compressed-air treatment, such as to be really efficacious, does not enter into practical therapeutics. More homely measures singularly effectual and everywhere to be procured are those enumerated below:

1. *The elastic emphysema jacket* which I devised some years ago and exhibited before the Medical Society in London.[3]

2. E. H. Willock's Rope Jacket[4] was also exhibited.

3. For infants I have recently described the empty-bronchus treatment of bronchiectasis,[5] a *costo-abdominal elastic belt* made of waterproof material, easily washed and dried, with buckles in front, and at the sides an insertion of a lacing of india-rubber cord or tubing. It is mainly abdominal, extending downward some way below the umbilicus, and upward not quite as far as the costal arch. But it is useful to attach to it in the back a lower thoracic elastic band, one or two inches wide, also buckled in front, which can be carried obliquely over the costal arch, and its pressure regulated nicely so as to stimulate the costo-abdominal breathing.

4. For infants the "Infant-rest" and for small children the "All-fours' Exercises" are invaluable.

5. Lastly, for all other ages, the "Convalescent Machine" described in my paper on "Convalescence and its Stages"[6] enables the breathless

[1] Munch. med. Woch., 1907, No. 38.
[2] Ibid., 1907, No. 48, p. 2373.
[3] Transactions Medical Society, 1900, p. 338.
[4] Ibid., p. 340.
[5] Medical Press and Circular, May 20, 1908.
[6] Ibid., February 19, 1908.

"advanced" emphysematous patient to walk, who might not be at first equal to using the machine in the prone position shown on p. 46. This use of it as an exerciser favors the expiratory emptying of the air-choked anterior lobes.

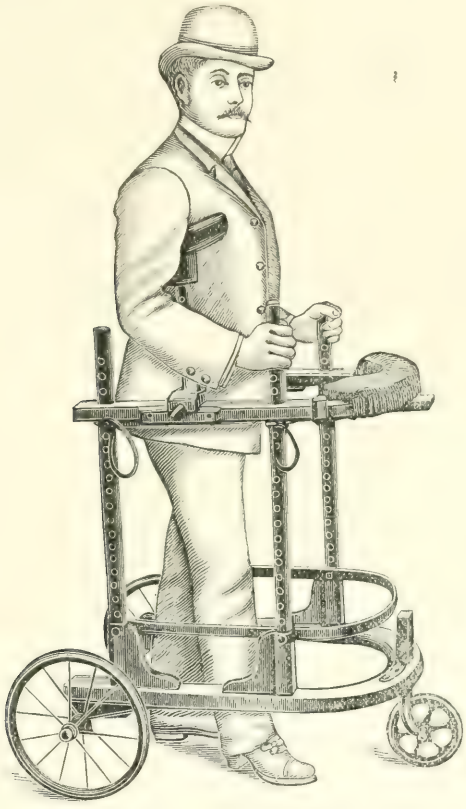


FIG. 11.—The convalescent machine as a walking machine, or crutches on wheels as used for the dyspnea of emphysema.

A CASE OF "FREUND'S DISEASE" WITHOUT EMPHYSEMA. K. Bayer's[1] case is likely to become historical, as it is the first in which the primary progressive thoracic affection described by Freund as eventuating in a rigid dilatation of the thorax, and in secondary emphysema of the lung, was diagnosticated through the earliest symptoms and having agreed with the picture which he had drawn of them half a century ago; and also the first in which the preventive operation was carried out at so early an age as twenty, and within less than six months of the onset of the disease, for before June, 1907, the girl's thorax is stated to have been perfectly symmetrical and normal. She then began to suffer from severe pain in the right upper ribs radiating into the chest

[1] Prag. med. Woch., February 13, 1908.

and right arm on using the latter. When first seen, September 24th, the *x*-rays revealed neither any thoracic nor any intrathoracic abnormality; but there was a strange prominence of the right upper parasternal region, with visible protrusion of the second and third cartilages, without much tenderness. When seen again on December 9th, the condition and the skiagraphic appearances not having altered, Bayer made the diagnosis of early *Freund's disease;* and he resected (through two parallel incisions) 3 cm. from the length of the second, 2.5 cm. from the third, and 2 cm. from the fourth right costal cartilages. The rib ends, which were normal, immediately approached the sternal border, with almost complete disappearance to the deformity. Recovery and convalescence were uneventful, and on January 13, 1908, the patient reported herself free from pain. On examination the excised cartilages presented the naked-eye changes described by Freund, closely resembling senile changes in color, consistence, and substance, viz., perichondral thickening and fibrillation, chondral thickening, and grayish, yellowish discoloration, with a firm outer zone and much softened centre; the latter showing under the microscope liquefaction and cell proliferation.

The Prone Posture in Thoracic Operative Surgery. Collateral evidence of the advantages of the prone posture is the recognition by surgeons that it is the posture par excellence for the safe performance of operations involving the thoracic cavity. The methods of Sauerbruch and of Brauer are most often not available and are complicated as well as costly. Elsberg, of New York,[1] has found that although in opening the thorax the surgeon may be content with the device of quickly pulling out a corner of the lung to obviate a rush of air into the pleura, it is much better to place the patient in the abdominal position as the risk of setting up pneumothorax is thereby greatly reduced. The same experience has been reported by Depage in France. Before adopting this important improvement Elsberg had found that in dogs the symptoms caused by acute pneumothorax were much relieved by the prone posture. He has found the latter specially useful in operations for empyema and bronchiectasis and in the transpleural incision of hepatic and subphrenic abscesses. Of course in the case of empyema there is much less strain of coughing during the evacuation of the pus than in the usual position, and in the more severe procedure of subphrenic operations there is comparatively little cardiac and respiratory distress. This is in entire agreement with the clinical observations made from the medical side.

The Intratracheal Method in the Treatment of Bronchial and Pulmonary Affections. At the Liverpool Medical Institution, Colin Campbell[2] exhibited a patient, aged forty-two years, as a case of *abscess of the lung* following pneumonia, successfully treated by his well-known intra-

[1] Zentralblatt f. Chir., 1908, No. 10; cf. Epitome British Medical Journal, May 16, 1908.

[2] Medical Press and Circular, May 20, 1908.

tracheal injections of izal. The illness had commenced with an attack of acute pneumonia on July 17, 1907. On the fourteenth day a large quantity of pus was expectorated and the acute symptoms were relieved. Pus continued to be expectorated freely; empyema was diagnosticated, but exploration failed to find pus. The patient's condition remained the same until October 29th, when Campbell commenced the izal injections. The patient was bringing up ten ounces of pus daily. At the end of a week he was taking two and one-half ounces of 10 per cent. izal solution at each daily sitting.

On December 16th the treatment was discontinued, the patient was apparently cured, having gained twenty-one pounds. He has remained well since and follows his usual occupation.

Campbell has also had remarkable results with his method in cases of pulmonary tuberculosis and of bronchiectasis.

THE HEART.

The Compensatory Character of the So-called "Passive Venous Congestion" is closely argued and supported by physiological considerations and pathological evidence by W. J. Calvert.[1] In tricuspid incompetence the liver and the venous circulation have to bear the strain of the regurgitation, which in the case of mitral incompetence is borne by the left auricle, the pulmonary circulation, and the right ventricle. These structures supply the needful compensation, and *mutatis mutandis* we may think and speak of the tricuspid insufficiency finding its compensation in the distensile repletion of the veins and in the quasi spongy distensibility of the liver, as this organ according to Salaman will under high pressures accommodate a volume of water equal to its own bulk. The compensatory function exercised by the venous congestion in question is illustrated by Calvert by the conditions witnessed in pericardial effusion. If considerable the great pressure of the effusion will compress the veins and stop the supply of blood to the heart, unless a considerable head of pressure be got up inside the venous system sufficient to open up the intrapericardial portion of the vena cava. This statement is more applicable to the superior vena cava than to the inferior, for the latter is protected against any danger of collapse by practically ending at the orifice in the centrum tendineum, to the edge of which it is firmly attached, and by being immediately continuous with the wall of the right auricle. The compensating function of the venous congestion is not limited to tricuspid regurgitation and pericardial effusion, but can also be traced in pleural effusion and in pneumothorax.

The Vicious Circles Associated with Disorders of the Heart are described by Jamieson B. Hurry,[2] under five groups connected especially with

[1] Johns Hopkins Hospital Bulletin, 1907, xviii, p. 44.

[2] British Medical Journal, April 4, 1908.

(1) the myocardium, (2) the endocardium, (3) the pericardium, (4) the neuroses, and (5) fall in blood pressure.

Group I. *Among the vicious circles associated with the myocardium,* conditions such as bronchitis and emphysema increase the resistance to the right ventricle, leading to its hypertrophy and dilatation. As dilatation gains on hypertrophy, congestion of the venous system interferes with the functions of digestion, absorption, elimination, and sanguification. The laboring myocardium is poisoned by the products of metabolism. A vast vicious circle is established embracing the great organs of the body. The weak and dilated ventricle and the increased resistance to the pulmonary circulation also act and react injuriously on each other, setting up a second circle of evil omen.

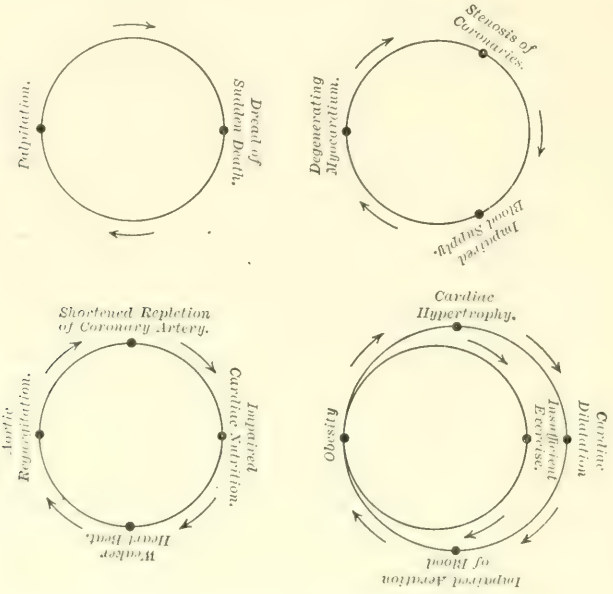


FIG. 12.—Diagrams showing the analysis of vicious circles into component factors. The fourth figure represents the double circle of obesity.

Again on the left side renal disease, gout, lead poisoning, and defective metabolism which set up a hypertonic spasm of the capillaries and arterioles require a more forcible cardiac systole to force the blood through the distant vascular system. The consequent hypertrophy of the muscular structures engaged reacts on and raises the blood pressure. To this an arteriosclerosis is often superadded. Obliterative changes in the coronary arteries are apt to ensue lowering the nutrition of the myocardium and its vitality. As this impairs the coronary circulation a second circle is established: and as the venous stasis on the right side produces sequels, no less than three forms of vicious circles may arise at different stages of arteriosclerosis, ending in grave cardiac disorganization.

In reality the changes described usually affect both sides simultaneously, although not to the same extent owing to their close anatomical and physiological relations. When the right side of the heart fails the whole of the coronary veins, which open into the right auricle, soon become engorged. Impaired circulation and nutrition of the whole heart are the result.

Anemia with fatty or other cardiac degeneration sets up a vicious circle. In sufficient vis-a-tergo, sluggish purification of blood, hampered digestion and absorption of food increase the anemia, while the anemia in its turn accelerates the degeneration.

Obesity induces a primary hypertrophy, followed in due course by cardiac dilatation, dyspnea on exertion, disinclination for active exercise, and eventually by an increase of the obesity. Thus obesity is in fact both a cause and effect of the heart lesion.

It must not be forgotten, however, that the lungs suffer quite as much as, nay rather more than, the heart. The reader will find this aspect of the question discussed in another part of this report under the heading of "Factitious Emphysema."

Enfeeblement due to overwork or other sources leads to an irregular and weak heart and to edema and congestion of the viscera. Dyspeptic disorders, such as flatulent distention, follow and further depress the heart, a reciprocal relationship being established between these organs.

Chronic alcoholism causing dilatation and enfeebling contractile power generates anorexia, palpitations, and want of energy. These symptoms drive to further indulgence and thus intensify the original mischief.

In acute disease such as croupous pneumonia or bronchitis the heart and lungs embarrass each other, and the vicious circle is frequently only interrupted by death.

Group II. *Vicious Circles Associated with the Endocardium.* In chronic valvular lesions accompanied by compensatory changes, sooner or later, when the compensation fails, there are in addition to the vicious circle due to broken compensation, secondary disorders in which reciprocal relations are met with. For instance in aortic regurgitation the state of repletion of the coronary arteries lasts a shorter period than normal, owing to valvular insufficiency. Hence follow impaired nutrition of the cardiac walls, lessened working capacity, increased regurgitation, and, consequently, a still less adequate repletion of the coronaries, culminating occasionally in sudden death. Or, again, the same may occur when tricuspid regurgitation results from the dilatation of the right ventricle secondary to mitral obstruction. For a time the reflex may relieve the overloaded ventricle, but ultimately its effect is to further weaken the power of the ventricle to overcome the obstruction. Mitral regurgitation and aortic regurgitation or obstruction mutually react (owing to progressive dilatation of the ventricle and auriculoventricular

orifice), and a morbid circle arises through the reciprocal effect on one another of the aortic lesion and the mitral regurgitation.

Analogous reciprocal results are witnessed in septic endocarditis and in congenital heart disease.

There is a vicious circle also in the case of the individual with heart disease who has to do physical labor and is condemned to a life of toil. The labor aggravates the heart lesion; the heart lesion (owing to associated dyspnea and palpitation) makes the daily task relatively, if not absolutely, harder than it would otherwise be.

Group III. *Vicious Circle Associated with the Pericardium.* Another vicious circle is set up when acute pericarditis leads to copious effusion. The effusion compresses the great vessels at the roots of the lungs, as well as those of the heart and pericardium, and thus hampers the circulation. The hampering of the circulation increases the effusion. A parallel condition is associated with pleuritic effusion, and the improvement that so often follows paracentesis, even when only a small quantity of fluid is removed, is probably due to the breaking of the circle by such removal.

Non-inflammatory dropsy of the pericardium or hydropericardium, due to venous stasis in the coronary veins or to some other cause, acts in a similar manner. The dropsy, often part of a general condition, in its turn aggravates the disease from which it sprang. In the words of Gibson:

Hydropericardium may be said to step in as the closing link of a pathological chain, and once it has made its appearance it unites with the other morbid conditions to form a vicious circle of fatal import.

Group IV. *Vicious Circle Associated with Neuroses.* With unduly neurotic patients worse trouble arises if the true state of the heart be revealed. Functional palpitation may cause an apprehension of sudden dissolution; an apprehension which may keep up and intensify the distress.

Excessive mental and physical repose perhaps keeps the heart feeble, and the over-rested heart calls for more rest, sometimes ending fatally. Vomiting brought on either through the vagus by mechanical congestion of the stomach may so depress the circulation as to accelerate the end. Lastly, in intermittent action a vicious circle may result from a mere repetition of the intermittence. The habit of intermitting leads to an exaggerated irritability of the cardiac nerve centres, and a continuance of the abnormal action even after the removal of the primary cause.

Group V. *Vicious Circles Associated with a Rapid Fall of Blood Pressure.* In cases of severe surgical shock causing paralysis of the bulbar centres, the blood pressure falls, partially emptying the cardiac and cerebral vessels, and the bulbar centres are still further weakened. Thus cause and effect act and react on each other leading to disastrous

consequences. Again, chloroform not only acts on the bulbar centres, but also causes dilatation of the heart, and further interferes with the compensatory mechanism. Syncope may also be due to a like interference with the vasomotor mechanism.

Prolonged pyrexia by reducing cardiac power causes the arterial pressure to fall, and as a result the functions of the digestive respiratory and nervous tissues suffer. Toxic products of metabolism accumulate and the vicious circle thus established ends in collapse. In extreme tachycardia the tachycardia and the lowered pressure are often reciprocally correlated.

An excellent illustration of an artificial circle occurred in connection with the repeated venesections of former days. Symptoms produced by the hemorrhage, palpitation, vertigo, violent headache, convulsions, coma, etc., resemble those of inflammatory disorders, and were attributed to a recrudescence of the original mischief. Venesection was attempted to remove the very symptoms it had produced.

In these and other vicious circles Hurry's graphic method of analysis, as shown in the diagrams (page 74), will often assist in defining the factors.

As regards treatment some special principles stand out:

1. The exciting cause must be sought, and its removal may in itself ensure recovery.

2. It is frequently desirable to actively treat also each of the several factors concerned.

3. When there is a choice of treatment, each practitioner must study the *locus minoris resistentiæ*. Hence results a varying modus operandi for the same disorder. For example for heart symptoms due to overwork in the city, one physician orders Switzerland; another prescribes a long spell of bed and "no worry." Recumbency will give less work, the warm bed will act on the skin and relieve the kidneys; the lighter diet will facilitate the work of the stomach and liver; the improved circulation and digestion will relieve the lungs and react in favor of the heart: in brief, physiological rest to brain, heart, lungs, and viscera, a change of air and scene being prescribed at a later stage. By these cumulative measures the vicious circle is converted into a healthy one, all the organs improving by degrees and helping one another in an ascending scale. Of these two methods either would at times be most successful.

4. Cardiac encouragement by judicious words of comfort, or in insomnia the use of morphine, may act as the charm.

5. To break many vicious circles associated with myocardial failure of compensation, treatment must increase the vigor of the myocardium or lighten its load. Above all must an ample supply of pure blood be secured to the myocardium.

Functional Diseases of the Heart are not the least important chapter in cardiology; but it is so extensive as to almost baffle the reviewer. This

is apparent in the two chief contributions of the year, by Huchard[1] and by F. Müller[2] of Munich.

The most important lesson to be learned from them and from the clinical observation of patients is that in a majority of cases "*it is not all nerves*," and it is not all "heart," but that a great deal of it all is stomach. As stated by Huchard "in the treatment of functional cardiopathies hygiene is very important, as also is diet."

Valvular Diseases. The Mode of Production of the Presystolic Murmur in Mitral Stenosis. E. H. Colbeck[3] explains the rarity of the presystolic murmur at the tricuspid orifice by the absence of the peculiar arrangement of valve flaps which at the mitral orifice leads to its production. Obliquity of the anterior mitral flap, if it should be abnormally kept up during the end of diastole, would cause the auricular blood to set the membrane vibrating with increasing force; and its vibrations being conveyed along by its fibrous attachments to the ventricular septum would be heard and felt at the spot where the latter approaches the surface of the chest. This abnormal obliquity would be caused by anything which might prevent the anterior flap from getting out of the direct path of the auricular current. Among these causes Colbeck points out that a loss of the diastolic expansion of the orifice in its left or posterior portion would be an effectual cause, and would probably explain the mechanism in a large proportion of instances.

The Mode of Production of Flint's Murmur. James E. H. Sawyer[4] has put forward a new theory to explain the mechanism more satisfactorily, on the basis of the peculiarities of this murmur, which he reminds us are as follows:

"Flint's murmur is usually softer, not nearly so rough in character, as that of mitral stenosis. It is presystolic in rhythm, usually not loudly heard, and only audible over a very small area just internal to the cardiac impulse. It is a short murmur, and never reaches the great intensity that is very frequently found in mitral stenosis. The murmur as a rule terminates with the first sound, but sometimes there is a slight interval between them. The first sound has not the slapping or thumping character so usually present in mitral stenosis.

The existing theories are:

(*a*) The "*vibration*" *theory*—viz., vibration of the anterior curtain of the mitral valve between two blood streams, the auricular flow and the back flow from the aorta. It may be rightly argued against this theory that the aortic reflex loses power from the moment it begins, whilst the murmur is not heard until the end of the diastole.

[1] Journal des praticiens, July 27, 1907.

[2] Archives of International Medicine, Chicago, January, 1908.

[3] Practitioner, February, 1908.

[4] Birmingham Medical Review, October, 1907.

(*b*) The "*deflection theory*, viz., deflection of the said curtain by the aortic back flow with the result of pushing it or lifting it across the free mitral orifice. This temporary obstruction or pseudostenosis we might be prepared to recognize at the beginning of a strong back flow, but hardly at its finish; yet this is the time when the murmur starts and grows with rapid crescendo.

Sawyer's "*relative stenosis theory*," suggested to him by Herbert French, is made clear by the diagrams. In the diagram of the dilated ventricle the mitral orifice diameter (upper dotted line) measures the same as in that of the normal heart, but it is much smaller than belongs to its great capacity as it is indicated by the ventricular diameter. By measurement he finds that the ratio between the diameters is the same as in the stenosed heart. He then argues that "as the altered ratio of

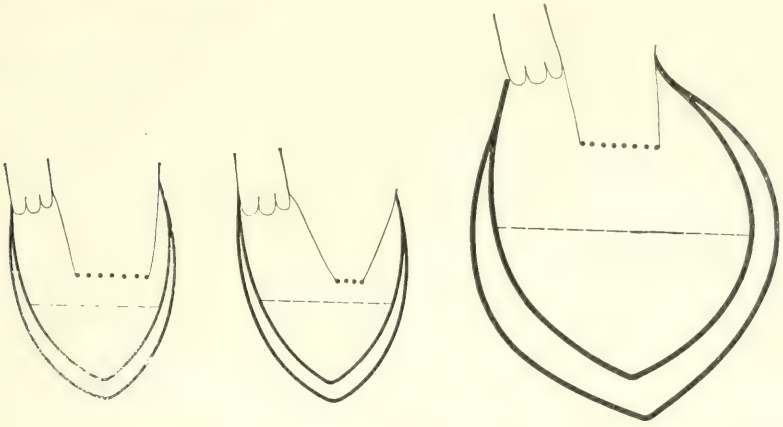


FIG. 13 FIG. 14 FIG. 15

FIG. 13.—Normal heart. Ratio of diameters of mitral valve and of left ventricle about 1 to 2.

FIG. 14.—Mitral stenosis. Ratio about ½ to 2. Presystolic murmur.

FIG. 15.—Dilated left ventricle. Ratio about 1 to 4; same proportion as in mitral stenosis. Presystolic murmur.

these two diameters produces in mitral stenosis a presystolic murmur, it is very probable that the same ratio, although the factors are on a larger scale, would produce in aortic regurgitation Flint's murmur, which is also presystolic in time."

In support of this theory he alleges "that a presystolic murmur is sometimes present near the cardiac apex without any aortic regurgitation, and without any mitral stenosis being discovered at the postmortem examination; but when such a murmur has been present there was always an enlarged left ventricle. This seems to point to the regurgitation of the blood through the aortic valves as not having any direct part in the production of the murmur. Speaking generally, if a presystolic murmur be present with the apex beat within the left mammary line, it is always

due to mitral stenosis, but with the apex beat external to this it may be Flint's murmur, and produced as described above."

We can give to the "relative-stenosis" theory of Flint's murmur full credit for ingenuity without thereby implying complete adhesion to it. It would be premature to attempt any definite judgment, for it will be noticed that the theory of this mechanism is based upon that of the mechanism of mitral stenosis. Hitherto mitral stenosis has had no proved explanation. We are therefore bound to suspend our choice between this which seems to be a fluid-vein theory and the theories mentioned above or any other theories.

Sawyer also refers to an important point in connection with the chordæ tendineæ, the increased tautness of which he contends would prevail in enlarged hearts, and would cause the curtains not to lie against the ventricular walls.

"Hemisystole" or Separate Contraction of the Two Ventricles, the possibility of which has been denied by many, has previously been reported by von Leyden[1] in three cases. He now adds a fourth to his list. His explanation is that in rare cases, owing to an excessive reflex through the incompetent mitral orifice, the left ventricle empties itself back into the left auricle and even into the pulmonary veins finding less resistance in that direction than in that of the aorta. It is only after a second contraction of the right ventricle that the left ventricle is sufficiently charged to perform an effectual systole. Whilst this ventricle shows little enlargement, the left auricle is much dilated and the right ventricle much hypertrophied.

Cardiac Asthma and Sclerosis of the Right Coronary Artery. Under this heading the following brief statement has been published by E. O. Jellinek and C. M. Cooper,[2] of San Francisco.

"We desire to advance a suggestion for the partial corroboration of which we have long waited for postmortem material, viz., that cardiac asthma is a right-sided angina, and that the common postmortem lesion will be found to be sclerosis or its equivalent of the right coronary artery. Our reasons for this suggestion we will bring forward later, but now simply wish to record the postmortem findings by Keith of two cases of Mackenzie's to whom one of us lately communicated the idea, and whom we desire to thank for his courtesy."

Case I.—During life: Angina pectoris plus cardiac asthma. Postmortem: Sclerosis of both coronary arteries.

Case II.—During life: Cardiac asthma; no angina pectoris. Postmortem: Marked sclerosis of the right coronary artery; left artery normal.

The Treatment of Heart Disease. Surgical Treatment. *Cardiolysis*, the important operation by which it is sought to set the heart free from the adhesions of chronic *mediastino-pericarditis*, has been noticed

[1] Deutsch. med. Woch., January 23, 1908.

[2] Journal American Medical Association, February 29, 1908.

in my previous reports as one of special interest to the physician as the suitability of the operation is a vital question which must rest upon the accuracy of his diagnosis. Urban's[1] contribution to the subject brings this into special prominence. He points out that mere agglutination of the parietal and visceral layers of the pericardium need not materially interfere with cardiac action and does not lead to symptoms. It is the thickening of the adhesions by subsequent inflammation and the spread of the latter to the mediastinal connective tissue which result in indurative fibrosis and progressive hampering of the heart. The heart in addition to its work of propelling the blood has to overcome the resistance of the anterior thoracic parietes which is continuous with the ventricular wall, and has to be dragged inward at each systole, and comes forward again during the diastole. Cardiolysis was proposed and carried out by Brader in 1902, and Urban's case is the eleventh which has been published.

The results he states have been encouraging in all the cases. His patient, a stonemason, aged twenty-two years, had suffered from dyspnea and palpitation since his rheumatic fever six years ago. The symptoms were dulness and harsh breathing at both apices, cyanosis, systolic precordial retraction particularly at the apex, which was found to beat outside the nipple in the sixth space, and was accompanied with a loud systolic murmur, reduplication of the pulmonary second sound and an irregular pulse with an average rate of 80 per minute. There was diastolic collapse of the jugular veins. The urine was scanty, but free from albumin. The symptoms of loss of compensation included general edema, ascites, and hepatic and splenic engorgement. The operation was undertaken on September 26, after ineffectual treatment by rest and diuretics. The patient left the hospital October 31, feeling well and able to run up stairs, with a precordial gap in his bony thorax equal to the palm of the hand and showing systolic retraction. The murmur persisted, but the reduplication had ceased and the pulse rate was 76 and regular. Radiography confirmed the percussion evidence of a considerable diminution in the size of the heart (3 cm. in the oblique; 2 cm. in the long diameter). The diastolic retraction of the jugular had almost disappeared; subsequent examinations were equally satisfactory.

The author refers in this connection to the permanence of the improvement in Brawer's patient, operated on in 1902, and still doing full work in 1906. As to the operation itself it is noteworthy that the turbulent heart's action quieted down immediately; the sixth rib was detached from the heart. The usual procedure is to remove portions of the sternum and of the costal cartilages *subperiosteally*—in this case only one inch of the cartilages of the fourth, fifth, and sixth cartilages and two inches of

[1] Wiener med. Wochenschrift, February 22, 1908.

the corresponding ribs—and subsequently to remove the periosteum and the intervening muscles together with the thickness of fibrous tissue. But in this instance, as there was no appreciable thickening of the adhesions, the posterior layer of the periosteum was left in situ, trusting that no extensive bony formation would take place.

Surgical Treatment of Mitral Stenosis. The conclusion arrived at by Cushing and Branch[1] is not to proceed yet to any surgical interference, although it is possible that the technique might be so much improved that it might be feasible to divide a stenotic mitral valve in the human subject as suggested by Sir Lauder Brunton[2] six years ago, and that it might be justifiable to subject a patient to considerable risk in order to relieve him of the progressive results of a contracting mitral valve. Still they do not consider that our present knowledge would justify such an attempt. One great difficulty is the absence of absolute certainty in any diagnosis. In their recent experimental investigation on 25 dogs, they succeeded with the help of McCallum's improved valvulotomy introduced through the heart muscle, in producing either regurgitation or stenosis to order. But when it came to relieving a stenosis which had been diagnosticated in a dog by highly competent clinical examination, the animal died on the table and the stenosis was not to be found.

Medical Treatment. Among heart tonics Wilcox[3] points out the well-known relative value of digitalis and strophanthus. Convallaria he regarded as untrustworthy, and adonidine as apt to set up renal irritation. Erythrophleum or sassy bark was a vasoconstrictor as powerful as digitalis and ergot combined, whilst like digitalis it slowed the pulse. Its use should therefore be limited to fairly competent heart cases with low tension.

In the group of heart depressants aconite and veratrum are most valuable in suitable cases, and the danger from the use of the latter has been exaggerated.

His practical suggestions included the iodide of arsenic in cardiac syphilis; the use of strychnine for cardiac debility, although patients were apt to become habituated to it; for cardiac failure with pulmonary edema hot coffee as a high rectal injection; and for the neurotic and the slow heart cactus, the only drug which increased both the frequency and the force of the heart, particularly with the addition of one-half grain of caffeine sodiobenzoate to each dose.

As a prophylactic against acute rheumatic endocarditis, sodium salicylate requires to be administered, according to Huchard,[4] during the night as well as during the day lest the lesion should develop during the

[1] Journal of Medical Research, February, 1908.
[2] Lancet, 1902, i, p. 352.
[3] New York Medical Journal, March 14, 1908, p. 519.
[4] Journal des Praticiens, October 19, 1907.

night; and to be continued for at least two days after the particular symptoms have disappeared in diminishing doses. He has a new term, "ensystole," to distinguish the first stage of a beginning cardiac lesion, the latent period of adaptation. Hypersystole, hyposystole, and asystole, are the progressive stages of aggravation calling for cardiac treatment by milk diet, purgatives including sodium sulphate, and Nativelle's crystallized digitalis.

The carbonic acid baths of Franzenbad were very successful in Selig's[1] case of mitral stenosis with myocarditis, in which all drugs were suspended. The patient was able to take her baths daily for forty-three days and felt the better for them, and for the exercises which consisted of passive movements, respiratory exercises, vibration massage applied over the vertebral column and later over the heart, tapotement and friction massage. The edema disappeared, the urine increased, and the cardiac enlargement diminished considerably.

Dietetic Treatment. A study of chloruria and of systematic hypochloridation is contributed by G. Etienne, of Nancy.[2] His paper deals specially with the late results of the method in connection with cardiosclerosis and the prophylaxis of hyposystole in the aged, and is based upon clinical observations in 24 patients upward of seventy-five years old. He calls attention to the fact that whilst the retention of chloride of sodium in the tissues detains water within them the converse result must follow, namely, the water detained in the tissues must attract a fresh quantity of salt. Etienne's method is as follows:

The urinary excretion of chloride of sodium is estimated after the preliminary period of exclusive milk diet has resulted in an equilibrium of body weight as shown by daily weighings. Chloride of sodium is then added slowly and progressively to the diet until the weight shows a tendency to rise. By this means the measure of toleration for salt is arrived at and the patient's permanent diet can be prescribed on the lines of cardiorenal safety. In practice a *salt-free diet* is prepared in the kitchen, and each patient is given daily his measured allowance of table salt.

The treatment of heart affections by a reduced supply of fluids brought before the Académie de Médecine, by H. Huchard and C. Fiessinger,[3] is a revival of an old method which had been pushed to excess and was subsequently abandoned. The conditions in which they have resorted to it with greatest advantage are arteriosclerosis and cardiac dilatation, and they consider that it deserves the credit in some instances where patients were rescued from imminent death. They found that in the extremity of the functional dead-lock, when dyspnea is intense, the insomnia continued, the edema all-pervading, and the kidneys

[1] Zentralblatt f. die Gesam. Therap., September, 1907.

[2] Les Archives des Maladies du Cœur, des Vaisseaux et du Sang, March, 1908.

[3] Bull. de l'Acad. de Méd., February 11, 1908, p. 168.

paralyzed the reduction sometimes acts in a manner too happy to have been expected. After the relief procured by one or two purges the reduced fluid intake allows of an increased output from the tissues, with great cardiac recuperation, a result similar to that observed in the treatment of acute hydronephrosis by thirst.

The practical rules in acute cardiac dilatation are as follows: On the first day, 1500 gm. (47 oz.) of fluid (milk, $\frac{1}{3}$; water, $\frac{2}{3}$). Of this one wineglass is to be taken every hour.

On the second and following days only half that amount, and from the fourth day the quantity of solid food must also be reduced.

Medicinally for ten successive days, alternating with five days of rest, $\frac{1}{10}$ mgm. ($\frac{1}{600}$ gr.) of digitalin is administered, and with it concurrently some theobromine which is to be regarded as a dechloridizing diuretic.

The first days bring about no marked change in the excretion which remains at 1600 to 1700 gm. (50 to 53 oz.). But on the following days there is an increase to 2000, 2500, and 3000 gm. (62, 78, 94 oz.); after the fifth day this sinks again to 1700 gm., or 1600 gm. (50 to 53 oz.), and continues at about that level for a variable time. Of course serous effusions have to be evacuated, and crural edema incised if necessary. If duresis should not occur, there is little hope in the case even if we should have recourse once or twice a day to injections of $\frac{1}{4}$ gm. (4 grs.) caffein.

It will be gathered from these statements that there is no intention on the part of the authors to present to us this method as a self-contained and all-sufficient remedy, but that the assistance of other powerful agents is sought. The point is that whereas previously the latter may have failed to act, the restriction of fluids may bring about a renewal of the efficacy of their administration.

Physical Methods of Treating Heart Disease. Rest, exercise, electrical applications, and mountain air are the agents dealt with in Arthur G. Bennett's[1] practical paper. Rest abundantly is provided for by a prolonged bed period in most cases, but sometimes it has to be specially prescribed.

The difficulty is to know when and how to begin the physical reeducation of the heart and of the muscles. Skilfully performed *effleurage* is the first indication, so modulated as to be sedative at first and then stimulating. Thumb- and finger-tip friction requires to be carefully graduated and applied at first to the scapulæ and upper dorsal spine, later to the precordium. Kneading or petrissage is a stronger measure. It includes the "fist-kneading" movements used for the abdomen. Tapotement and vibration are yet more active and to be used with discrimination.

[1] Practitioner, December, 1906.

The *heart message* of Oertel, not deserving of the comparative neglect which has befallen it, is really a respiratory exercise. It consisted in pressure on the thoracic walls during forced expiration. The hands of the operator were placed in the axillæ, and, with the expiration of the breath of the patient, were drawn down toward the costal margin, with a progressively increasing pressure.

Abdominal massage fulfils the following indications:

1. It has a diuretic action whether alone, or in conjunction with the Swedish exercises.

2. In cases of visceral and subcutaneous edema, diuresis is rapidly induced.

3. The general condition improves with the circulation and the more normal urine.

4. The massage as well as the Swedish exercises can produce increase, or diminution of pressure at the level of the heart and vessels.

5. Massage will supplement the action of drugs, and may be alternated with them, or even replace them.

6. It is a truly physiological therapeutic measure.

As regards electricity Bennett favors the sinusoidal high frequency, as this, owing to its reputed capacity for stimulating cell activity by its minute vibrations, and also its ability according to Schnee to influence the rate of the blood stream, appeared to him the most useful form to order. It is credited with the power of lowering the blood pressure.

When prolonged confinement to bed has to be enforced he uses electrical massage with the faradic current.

Exercise may be *purely passive, combined passive and active or purely active.* Each of these sets is capable of endless graduation.

The passive movements of hand and foot flexion, of extension knee flexion, and extensive flexion and extension of the forearms which are called depleting movements do not demand increased efforts on the part of the heart itself, but when a muscle is thrown into activity, whether active or passive, the bloodvessels of that muscle expand.

Active exercise should be commenced at first lying in bed. Full extension of the feet and toes with gradual but complete subsequent flexion. Next the knees should be flexed and extended. Then abduction and adduction of the thighs. With a little practice, after a time the opposing muscles can be brought into play and be made to supply resistance to the movements of the different parts of the body described. Finally, flexion and extension of the forearms followed by abduction and adduction of the upper arms.

Slight active resistance may next be offered to these movements by which the pulse should be slowed until gradually the patient's condition may be equal to the performance, out of bed, of resisted movements consisting of nineteen separate exercises in the following order:

The first five to the arms, the next three to the trunk, the next four to

the arms again, the next four to the lower extremities, the next two to the arms and hands, and the last to the feet.

Thus a very large proportion falls to the upper extremities. A point deserving particular attention as the leg movements are those which a patient can best tolerate; as Oertel's system derives its chief importance from the leg exercises, and as Wide, of Stockholm, distinctly states that in severe cases of heart disease it is better never to give any other arm movements than those of kneading and rolling, with arms never raised higher than the shoulder-joints.

Instances of the influences of movements of the arms upon the heart are of every-day occurrence. They include the device of raising the arms in epistaxis, the "strap-hanger's vertigo," and the faintness of the artist's model from prolonged attitudes with raised arms.

Respiratory exercise is one of the most important elements of treatment. Bennett dwells upon the harm which results from our prevailing ignorance how to breathe, and upon the value of training the heart patient in that function.

The effect of inspiration is to aspirate blood into the right auricle and thus to provide for an increase in systemic blood pressure. Expiration, unless forced, has very little influence on blood pressure. But when it is forced, then the pulmonary circulation is obstructed, and blood pressure outside the thorax falls. With the fall of blood pressure, that is during expiration, the heart beats less rapidly. The left ventricle has a chance of emptying itself more thoroughly. This is the raison d'etre of Oretel's heart massage.

All these views expressed by Bennett are likely to meet with general support. No risk need be incurred which cannot readily be met. But journey to the altitude is a matter for separate consideration. There is no doubt that the mountain offers unequalled advantages for a variety of cardiac conditions. But like other strong remedies it requires to be graduated; and it will be well to follow Bennett's advice to begin with a low elevation, and in no case to exceed an altitude of 1000 feet.

The physiological principles of physical training brought forward for discussion before the United Services Medical Society by M. S. Pembery,[1] have a bearing not limited to the personnel of the Army and Navy. His chief propositions are: 1. The true object of physical training should be the increase in the recruit's strength, agility, and capacity for muscular work. The power of endurance is far more important than a conventional military figure or the acquirement of acrobatic tricks. 2. The principle of progression from easy exercises to more difficult exercises of longer duration is essential especially for recruits. 3. Unusual movements or postures produce an amount of fatigue and expenditure of energy disproportionate

[1] Lancet, March 21, 1908.

to the work done. 4. The uniform development of all the muscles of the body is unnecessary and uneconomical. The soldier should specialize according to his work. Marching and digging are exercises in which infantry soldiers require progressive training. 5. A "strictly military position" does not "assist greatly in the free and full action of the heart and lungs and the consequent development of the whole body." 6. The position of attention is an abnormal position, which could be defended only as discipline. 7. In marching the natural movements of the arms and the swing of the body should not be suppressed. 8. So-called "breathing exercises" are based upon an erroneous interpretation of the physiology of respiration. In practice they might produce emphysema and increase the risk of infectious diseases. (9) The natural method to improve the "wind" is progressive running. A good "wind" is something more than a big chest; it is the capacity of the heart and lungs to accommodate themselves to the demands made upon them by muscular exercises. 10. The idea that artificial expansion of the chest gives freedom of action to the organs within is erroneous and pernicious. 11. Exercises which produce prolonged fixation of the chest during muscular work are unsuitable for recruits. 12. Training involves the accommodation of the recruit to an outdoor life. Work in the open air hardens a man, diminishes his liability to "colds," consumption, and other infectious diseases and improves his appetite and nutrition. 13. Games have a more beneficial effect than irksome exercises. 14. Obstacle races, boxing, wrestling, swimming, bayonet fighting, and fencing should be encouraged. 15. Exercises with the horizontal bar, parallel bars, pairs or rings, Indian clubs, and dumb-bells should be discouraged. 16. Span bending, abdominal, and dorsal exercises are not free from danger. 17. The official tests of proficiency should be those which brought out a recruit's capacity to coördinate his muscles, to accommodate himself to the demands of muscular work, and to bear fatiguing exercise without undue distress. 18. Military competitions and display should consist of exercises of military value.

THE BLOODVESSELS.

Arteritis. Baginsky's[1] case of septic aortitis and aneurysm is of special interest as occurring in a child aged seven years. Marmorstein[2] has also reported two cases of infective primary aortitis after influenza, and he quotes Thayer and Brush's article on "Infective Aortitis," in the *Journal of the American Medical Association*, September 10, 1904.

The existence of a rheumatic peripheral arteritis, contended for by various French writers, is insisted upon by M. Roch and R. Burnand.[3]

[1] Med. Soc., Berlin; cf. Med. Press and Circular, March 18, 1908.
[2] Journal American Medical Association, April 18, 1908.
[3] Semaine Médicale, March 25, 1908.

It is usually overlooked and as a rule transient, but it probably predisposes to arteriosclerosis.

In their own case there was (1) progressive pain; (2) recurring arterial pain with periods of pyrexia; (3) peri-arteritic nodules, swelling, and edema; (4) transitory arterial obliteration; (5) obliteration along a considerable length; (6) prior to the obliteration an increased amplitude of pulsation in the artery affected.

Nodular Peri-arteritis. The record of a case of nodular peri-arteritis, a severe affection beginning with rheumatoid pains, then progressive anemia, tendency to jaundice, as well as various local vascular results, including aneurysm and rupture, and usually proving fatal in three or four months, is added by H. Benedict to the previous list of 20 published cases. The diagnosis is difficult. The treatment has been chiefly by iodide and mercury. His own case recovered spontaneously.

Arteriosclerosis. "*Atheroma*" and "*diffuse arteriosclerosis*" are in Russell's opinion totally distinct. The latter he regards as due to "the continual irritative stimulation of the arterial wall, manifested clinically in the sustained or recurring hypertonic contraction," whilst the early occurrence of a fibrous hyperplasia of the tunica intima shows that the vessel changes are not to be attributed to a mere nerve influence, but to the blood itself. It is in this affection that the combination of structural thickening and of hypertonic contraction gives rise to those exceeding high hemomanometric readings which have been generally misinterpreted.

The aim is to prevent hypertonic contraction. If the vessels are already sclerotic the prevention of hypertonus will often prevent the loss of the faculties which make life worth living if the proper measures be adopted to allay arterial irritability." With this practical purpose in view "the changing tonus of the thickened vessels can be followed by the hemomanometer, and the records correctly interpreted are a valuable guide to prophylaxis. The instrument ought, however, to be called the *angiomanometer* when used as an instrument in clinical pathology, for the clinician must recollect that, given thickened vessels, the instrument records not blood pressure, but arterial resistance."

The Minor Signs of Arteriosclerosis, according to O. José[1] may be persistent or may appear only as the result of labor or fatigue. 1. General fatigue on slight exertion, accompanied perhaps by painful sensations, as intolerance for certain substances such as alcohol and tobacco. 2. Vasomotor flush of the teguments of the face, or, on the contrary, pallor. 3. Nervous inaptitude for work, modifications of character, headache, abnormal sensations in the limbs with some difficulty of movement, neuralgic pains, vertigo, insomnia, neurasthenia, and traumatic neurosis. 4. Loss of hearing. 5. Ocular troubles,

[1] La Presse Médicale, October 28, 1907.

such as arcus senilis, thrombosis of the central artery of the retina, etc. 6. Respiratory dyspnea, and a condition of emphysema, the true cause of which is not easily to be recognized unless in possible relation to arteriosclerosis. 7. Epistaxis. 8. Edema of the legs. 9. Palpitation, sometimes with angina; in some also tachycardia. 10. Arterial overtension, continuous and persistent. 11. Renal insufficiency is slight or considerable.

Juvenile Arteriosclerosis. An interesting instance of this remarkable condition is recorded by F. Fremont Smith.[1] The case was that of a boy, aged twelve years, with an aged, thin, pinched appearance, whose arteries were in a state of diffuse sclerosis with calcification, obviously traceable to syphilis, as the father, a mulatto aged thirty-two years, had syphilis at the age of eighteen and presented sclerosed and beaded arteries, with a recent obliterative arteritis, and gangrene of the toes. Earlier pathologists have regarded the affection as rare; but it is more accurate to speak of it as uncommon, though it may often pass unobserved. In its lighter forms it has been shown by Ortner, Flexner, Thayer and others to be frequently induced by an acute infection, and Osler has drawn attention to the importance of heredity as an etiological factor in those cases where none of the more direct influences can be traced.

Presclerosis. The use of this vague expression, which has become the fashion on the authority of Huchard, was foreshadowed in Mahomed's[2] views on prenephritic rise of blood pressure. Russell believes that the use of this term can only tend to aggravate the confusion which now prevails and which is due to "the failure to separate the two pathological conditions of atheroma and of arteriosclerosis." As a fact, "although hypertonus is the forerunner of sclerosis, sclerosis need not follow hypertonus. But Russell cannot imagine substances in the blood producing wide hyperplasia of the tunica intima and not causing prolonged hypertonic contraction of the media, and its consequential hypertrophy." In other words, toxic substances in the blood may act as "muscular excitants" long before they take effect as irritants to the intima. Doubtless predisposition and vulnerability may have much to say to the results of the blood contamination in the individual.

Presclerosis, on the other hand, is sufficiently vague to come into wide clinical use as fitting many situations in daily practice. When we have used it we have nearly negatived the presence of a condition of which in strict pathology we know very little by declaring that it is not there, at any rate not there yet. We are, therefore, still in touch with the mechanisms of health with which we are more familiar; and both for the patient and for ourselves the position is better than it might have been.

[1] Journal of Medical Science, April 4, 1908.

[2] Royal Medico-Chirurgical Trans., 1874.

"Arteriosclerosis," as we understand the term, is a condition of more or less advanced decay of the arterial wall, presenting varieties which we have great difficulty in separating one from the other and still greater difficulty in tracing to their respective causations. Emphatically the word connotes a terminal result, the product of a disease. What is that disease? None of us can demonstrate its nature. It has not even a name; and when we have to refer to it we are compelled to fall back upon the use of the term "arteriosclerosis" which we had already reserved for its late results.

In presence of our ignorance concerning this morbid process, it must be confessed that there is something of boldness in the attempt to define the morbid condition from which it is derived, and we are reminded of the criticism "Ignotum per Ignotius."

To put more clearly the degree of vagueness in which we are involved: When we say of a man that he has "presclerosis" we may mean (1) to imply that he is the subject of early disturbances that tend to develop the affection known as "arteriosclerosis," which eventually leads to the familiar destructive lesions of the aorta and of the arteries. That man is to be congratulated for he has not got "arteriosclerosis."

But (2) we might have meant by "presclerosis" in his case that, although free from the advanced lesions he was already the subject of the disease which produces them. That would have been a very doubtful compliment, as it would have implied that he had "arteriosclerosis." So much for the vagueness and the ambiguous meaning of the word.

In daily practice we meet with two conditions: (*a*) the man with thick, leathery and perhaps slightly calcified arteries; he is an undoubted "arteriosclerotic;" and (*b*) the man with large pulse, perhaps too strong and perhaps rather too long sustained, though not necessarily very hard and his systolic blood pressure raised. In many such cases, some might say in all such cases, "arteriosclerosis" is already at work, even if only at its earliest stage; call it "presclerosis" if you will. But there are those who would say with William Russell that the arterial conditions mentioned do not in themselves bear any such interpretation, and that the subject in question might never develop any arterial degeneration; or would say with Wilhelm Winternitz that simple neurasthenia is very often mistaken for presclerosis.

Practically then whenever we are dealing with a definitely rigid artery, as in the first case, our using the term "presclerosis" will not be ultra vires, but on the contrary a mild euphemism. But whenever applying it to cases in the second group we may be guilty of an imputation which possibly may be undeserved, and of affixing a stigma fraught perhaps with material detriment, over and above the considerable moral damage which the sinister suggestion might convey. Considerations of this order are likely to limit for some of us the uses of the term "presclerosis" as a clinical expression. But for the larger number of clinicians there

will be probably less reticence, and they will probably continue to use the word as an equivalent for the "early stages of the arteriosclerotic process."

The symptoms of presclerosis, as originally given by Huchard, are enumerated by Wilhelm Winternitz[1] as being: high blood pressure, ringing aortic second sound, and roughness of the first sound; fatigue readily induced by slight exertion; suspicions of angioid heart pain; odd colicky pains arising after bodily or mental exertion; paresthesia in the extremities; and, lastly, the important symptoms of a feeling of collapse and giddiness combined with feeling of pressure upon the head on rising from bed in the morning.

The treatment of presclerosis is considered by Winternitz[2] to be essentially the same as that of the declared affection. Above all attention should be paid to prophylaxis, and this involves a consideration of the etiology of arteriosclerosis. In the adult we have to deal with the damaging effects of a variety of poisons, which interfere with the perfection of the play of the peripheral arterial mechanism. As this sets up peripheral obstacles to the freedom of the circulation, the blood pressure rises. The chief poisons in question are tobacco, alcohol, lead, malaria, and syphilis. Another group is that of the acute infections which have been shown by the investigations of Ponfick, J. Wiesel, and others to be a fertile source of degenerative lesions of the arterial wall. These lesions according to Devoto occur with considerable frequency in juvenile subjects (below twenty-five years of age), namely, in about 48 per cent. of the cases of acute infection; and at that period of life are more common than the lesions belonging to the first group. It is therefore of primary importance to lessen as much as possible the duration of the infection in any given subject, and Winternitz knows of no better means for that purpose than the judicious application of suitable *hydrotherapeutic* measures.

The actual treatment recommended for presclerosis and for arteriosclerosis is made up of the dietetics and of the physical hygiene of the affection. Limitation of animal food and a modified vegetarianism are desirable, and Winternitz also recommends frequent and small meals.

The object of physical hygiene by electric, thermal, and mechanical stimulation is to bring about a free circulation through the cutaneous vessels. It is a fallacy to suppose that there need be any danger of the blood pressure of arteriosclerotic patients being raised to a dangerous height by properly conceived remedial measures. As a fact whilst the latter are shown by a special research undertaken by Winternitz's assistants, Wertheimer and Wornfeld, to occasion a slight rise of from 10 mm. to 20 mm. of mercury, the ordinary functions of sneezing, coughing, straining, etc., will raise the pressure easily as much as 30 mm.

Winternitz has found that a persevering continuance of the exercises

[1] Fortschrift der Med., January 10, 1908. [2] Loc. cit.

ends in a lasting reduction of the blood pressure of these patients. He endeavors to explain this by assuming that the vascular system of the skin with its muscular fibers is practically equivalent to an independent pumping station or to a kind of accessory heart, which by its sucking action relieves pressure and supports the action of the ventricle, and he is inclined to believe that the stronger flow of blood through the bloodvessels is likely to lessen the tendency to calcification in their walls.

The fractional Scotch rubbings introduced by Winternitz are likely to be found exceedingly useful not alone in arteriosclerosis, but for the benefit of a variety of susceptible and enfeebled patients. The treatment may be restricted to one part of the body, or it may be applied to the entire body surface in detachments. The method is as follows: the limb is surrounded with a large compress dipped in water at 40° C. (104° F.) and rubbed with it. A cold wrap wrung out of water at 10° C. (50° F.) is then to be substituted, and through this wrap strong rubbing is to be applied. This modification of the hot and cold douche brings the advantage of the latter within the endeavor of many who hitherto have not been regarded as fair subjects for its employment.

Blood Pressure in Relation to Disease. The Normal Factors of Blood Pressure. The arterial system is an attractive and a promising field for study by the clinician, but he has to contend with difficulties which perplex even the specialized opportunities of the physiologist and of the pathologist. His first need is for a plainer conception of the subject matter and of the problems which are within the scope of his own investigations. In his excellent monograph William Russell[1] has set himself the task of dispelling the prevailing confusion and of clearing the ground of those misconceptions which he regards as the worst obstacles to progress. The first among the latter is the too exclusive attention centred upon blood pressure, with the neglect of the factor arterial wall. Another is the fallacy of regarding the arteries as mere elastic tubes oscillating under the antagonized efforts of the heart and of the arterioles.

Arterial Tonus, Hypertonus, and Spasm. We should remember that tone or tonus is a muscular function under the fine control of the sympathetic. Leonard Hill, who has shown that it is soon restored after section of the vasomotor nerves believes that it is then maintained by the blood pressure itself, but clinical observation shows that another factor must be taken into account.

Given this average muscular tone and its variations with which we are familiar in the entire muscular system, we come to the wider range of active muscular contraction, a study which in the arterial system has hardly yet been undertaken. Is the arterial pulsation partly made up of

[1] Arterial Hypertonus, Sclerosis, and Blood Pressure. William Green & Sons, Edinburgh and London, 1907.

an active contraction rhythmically recurring in response to the beat of the heart? Russell inclines to that belief, but he has long dwelt, and he dwells again upon the better known conditions of arterial hypertonus. Hypertonus is of daily observation in pathology, and is also a physiological function of digestion and of strain. The extreme degree of this hypertonic contraction, when confined to a limited section of an artery, and causing its obliteration, deserves the name of arterial spasm.

The Heart, the Aortic, and the Peripheral Pressures. There is no better illustration of the "*vital*" side of the circulation in contrast with its purely mechanical reactions, than the compensatory contraction of the systemic vessels which accompanies the dilatation within the splanchnic area during digestion. This helps to obviate too sudden or too great a depression of the aortic pressure, yet in this as in other instances, according to Russell, the contraction of the vessels is apt to be misread "raised blood pressure." In all cases it is with the *aortic pressure* that the heart has to deal immediately and this aortic pressure is capable of finding relief in various directions, but chiefly in that of the splanchnic area and of the veins. If this relief should happen to fail, there is, he points out, another regulating mechanism in the overdistention of the left ventricle: this slows the heart through the vagus terminals and allows more time for the blood to travel through the constricted area.

The healthy heart is credited with an almost unlimited reserve of power, the exercise of which leads to hypertrophy; but we hardly need reminding that diseases such as fatty and other degenerations and senile decay must lessen or finally abolish the reserve. Russell insists that if constriction of peripheral vessels meant a rise of pressure within them, as is too often assumed, the labor of the heart would be immensely greater; whereas the rise of pressure is within the aorta and is capable of relief. It is fundamental, then, not to mistake the resistance of the wall of a constricted artery for the resistance of the blood pressure within it.

The Factors of Blood Pressure. *The factors of increased resistance of the arterial contents* leading to increased cardiac work are conceivably of two kinds: change in the viscosity or specific gravity of the blood, or change in the bloodvessels themselves. Russell doubts whether viscosity possesses that supreme importance in raising capillary pressure which has been attributed to it "as fluid so readily passes into and out of the blood." Alterations in the bloodvessels which include the pathological conditions as well as functional changes in calibre are thus the main agents of increased resistance.

To the clinician the all-important factor in questions of blood pressure centres in the heart. When the vessels are constricted in one region the heart may be so powerful that the danger is a vessel rupture in another; on the other hand the heart may be so feeble that there is imminent risk of syncope. With incomplete conceptions of "peripheral resistance" and "blood pressure" the central factor may be obscured.

Whatever tends to lead away from this view of the circulation, and whatever methods tend to obscure this aspect of it require to be employed with great caution.

Arteriosclerosis. The term arteriosclerosis is applied by Russell to all thickened vessels, other than those thickened by atheromatous degenerations, namely, (*a*) pure hypermyotrophy, (*b*) hypermyotrophy with thickening of the internal coat, and (*c*) those in which the adventitia is also thickened. Clinically we have before us the task of differentiating atheroma from this group, and its three members one from the other. He has but rarely found the radial artery purely hypermyotrophic as described by Savill in 1897, but, on the other hand, he finds hypertonus a frequent accompaniment of arteriosclerosis. This combination is of great practical significance, and also that which he has traced in the majority of cases of atheroma. "The idea of the fixed and rigid tube" has to be given up, save in extreme cases. Even in vessels with rigid segments and flakes suggestive of a brittle calcareous casing, and with a pressure of 190, erythrol, iodide of potassium and squill, together with physical rest and dieting may so relax the artery that the finger realizes that the artery has been the subject of hypertonus in addition to its atheroma.

The thickness of the arterial wall is a varying quantity not only in the healthy arteries, but in those altered by disease. Putting aside the calcified condition, the conception of arteries as rigid tubes is, according to Russell, erroneous. Even those arteries which are permanently sclerosed are liable to tonic variations in size; thus there is such a thing as a hypertonus not only for healthy undue contraction or non-thickened vessels, but also for those diseased whether they be sclerosed or atheromatous, and its causation is sometimes from nervous reflex, more commonly from blood impurity. A long continuance of these agencies, but chiefly of the latter, tends to establish permanent thickening in addition to the merely functional hypertonus induced at first.

The causation of the hypertonic contraction is partly "nervous," partly "toxic" in the wider meaning of those terms, but the more important share belongs to the contamination of the blood with nitrogenous waste and the products of imperfect metabolism. And this is the first step in all raising of blood pressure which goes on to arteriosclerosis. Elliott's investigations on the "localization of the toxic action on the vessel wall" has helped to throw light upon the etiology of hypertonus.

"Sustained hypertonus indicates the continued presence of substances in the blood which act by irritating the vessel walls leading to their hypertonic contraction. These substances betray their hurtfulness by their action. For sustained hypertonus is hurtful; it raises peripheral resistance and keeps it unduly high; it prevents the peripheral flushing with blood which is required for full cell vigor, and for the complete removal of refuse and waste."

Hemomanometers and the Pressure Readings. Among the Riva Rocci modifications Russell prefers George Oliver's instrument not only because of the convenience of the spirit index for carrying, but because the "wrist bag" allows the pulsations to be seen and enables its movement of cessation to be timed by the eye.

The factors in determining the levels reached are (1) soft parts and these take little effect, (2) the thickness of the arterial wall and this takes a considerable effect, and, lastly, (3) the blood pressure within the vessel.

Russell has satisfied himself that in perfectly soft arteries the normal pressure is from 105 to 115 mm. and not above 120—capable of falling 20 mm. during sleep—and capable of rising 20 mm. after violent exercise. This he adopts as the limit of reserve of power of the normal average heart. The heroic readings up to 300 mm. are in reality misreadings. Had they been genuine blood-pressure readings they would not have been consistent with the frailty of the human frame, since it is not safe in some subjects to raise the pressure even by the ordinary additional 20 mm. Hg. As a fact the hemomanometers measure blood pressure only in normal vessels; in thickened vessels they measure indiscriminately in addition to the arterial compressibility. In that respect they deserve to be termed "angiomanometers" rather than hemomanometers.

Clinically "it will be found that some moderately high pressures, say 140 to 150 mm. Hg., are due to hypertonic thickening, and that both pressure readings and thickness of wall can easily be reduced to normal; that in other instances still higher pressures, say 220 to 240 mm. Hg., can never be reduced to normal, but that a lowering of 20 to 40 mm. Hg. or rather more may be induced, and that it corresponds with a measure of wall relaxation which is readily appreciable to the finger."

Pulse-gauge Fallacies. As in every-day practice the state of the radial pulse is used as a test of heart power; it is of course essential to realize that there are two factors in the pulse which are variable and which constantly vary, namely, the pressure of the blood and the compressibility of the arterial wall. Current impressions perhaps require to be modified in connection with both these factors. Enough stress has not been laid according to Russell upon the fact that the radial artery is liable to being at times tightened up and at others relaxed. This should no longer be overlooked. But something worse than a mere oversight is he thinks implied in some of the modern teaching based upon instrumental readings, the fallacy that blood pressure is heightened inside a tightened-up vessel. It will be seen that this is a fundamental question and that he has devoted some pains to its elucidation.

Tactile Sphygmology versus Hemomanometry. No doubt can exist that the systematic use of pulse gauges has considerably discouraged in our time the teaching and the practice of tactile exploration. It if can be known that the instruments at our command do not clearly dis-

criminate between the two resistances, that offered by the vessel wall when thickened and that belonging to the pressure of the blood within it, greater stress must be laid once more upon the potentialities of finger palpation. The ability of the sense of touch to achieve a great deal in this direction by cultivation has been attested by a long succession of eminent clinicians. Russell believes that we can train ourselves to estimate the pressure inside the artery "no matter what the thickness of its wall," and he regards this study of paramount clinical importance.

What is the State of the Blood Pressure within an Artery when it is Contracted? The common impression is that the blood pressure is raised by the arterial spasm. This, according to Russell, is entirely wrong, and he has set himself the task of exposing the fallacy. For this purpose he has constructed and used, with Dr. Cargill Knott's mathematical and technical assistance, a new scheme of the circulation which demonstrates and measures the share appertaining to the tube wall in that obliterative total of pressure which is usually ascribed entirely to blood pressure. Three rubber tubes of different thicknesses are used, each provided with its pressure gauge, all three being attached to one common siphon supply tube. The amount of the "obliterating" pressure for each of them is determined by Oliver's hemodynamometer. The results are sufficiently striking.

If a mere constriction be made it is found that in and beyond the constricted area pressure falls; above it, pressure rises.

When constriction is increased to *obliteration*, whilst the internal pressure through the system of tubes is equal to 30 mm. Hg., the obliterating pressure varies with the thickness of the tubes. Tube *A*, so thin that when empty it collapsed in the same way as does a healthy juvenile radial artery, the obliterating force measured 10 mm. Hg.; in tube *B*, 40 mm., and in tube *C*, 84 mm., respectively. It was obvious from this comparative determination that the tube wall resistance of tube *B* equalled 30 mm. Hg., and that of tube *C* 74 mm. Hg.

Another telling result related to the different behavior of the internal pressure above the obliteration. In tube *A*, which gave way under it, it rose to 70 mm.; in tube *B*, to 65 mm., and in tube *C*, to 12.5 mm. only. This remarkable difference is regarded by Russell as demonstrating the great rise in pressure which would take place in all collapsible arteries of the size of the radial if they failed to contract along with the arterioles and with the capillaries. These experiments open up a considerable outlook in the direction of the pressure-adaptive functions of the arterial wall.

Individual Vessel Sensitiveness. Great importance attaches to the clinical suggestions which arise under this heading, some of which are discussed by Russell. *Idiosyncrasy* is a matter of common observation in connection with the alimentary tract and with the skin. It has not been thought of in connection with the coats of our arteries, yet some

of the cutaneous manifestations such as *urticaria* are really vascular. This conception of individual exaggerations on vascular irritability throws light upon a variety of puzzling clinical observations not amenable to merely instrumental investigations, and in which hypertonus plays a leading part.

Still more important is the observation that "it has been shown by the physiologists that vessels become more sensitive, acquire an 'exaggerated irritability' to some of the constrictor substances, after degenerative section of the vasomotor nerves. Russell has observed that in the sclerosed vessels of old people this extreme sensitiveness is sometimes very marked, and that it persists after nerve impulses have clearly become dulled. The recognition of this is of immense importance, for arteriosclerosis may be unaccompanied by symptoms requiring medical skill, whereas the advent of hypertonus always heralds symptoms referable to one or other organ. The hypertonus becomes thus an indicator of blood condition, not of nerve-centre perturbation. The brain perturbation, when present is of vascular origin."

Localized Vascular Disturbances. H. L. Elsner's[1] paper on "Vascular Crises" and J. Teissier's[2] paper on the "Diagnostic Importance of Partial Hypertensions in Regard to the Symptoms and Complications of Arteriosclerosis" are both practical clinical studies in the puzzling combinations between structural and functional vascular abnormalities. Teissier endeavors to define vascular distinctions within which the superficial artery by its hypertension tells of the morbid process in the deeper or visceral artery. For instance the temporal artery, the pedal artery, or the brachial artery would each tell respectively of arterial disease in the brain, or in the abdomen, or in the thoracic aorta, or the coronaries.

Among the varied instances of acute vascular crises, determined by some sudden local spasm or dilatation of the small bloodvessels, Elsner mentions temporary paralysis as possibly alternating, when not coinciding with cardiac angina. He believes that heart block may be due to a recurring ischemic denutrition of His' bundles and of the myocardium by arterial spasm.

The same subject has been worked at from another aspect, that of the effect of pleural paracentesis upon blood pressure, by Capps[3] and Lewis.[4] The result of their experiments is that the mechanism of the fall of pressure is reflex. There are two types of reflex: 1. The cardio-inhibitory type which is rarely fatal; the respirations as well as the pulse are usually slow, and in the pulse the range between systolic and diastole pressures is considerable. (2) The vasomotor type is more

[1] Med. Soc. of State of New York; cf. New York Medical Journal, April 25, 1908.
[2] Bull Acad. de Méd., February 25, 1908.
[3] Practitioner, February, 1908.
[4] American Journal of Medical Sciences, December, 1907.

often fatal, the respirations are shallow and rapid, and the pulse shows a rapid decline of pressure with relatively little difference between systole and diastole. A recognition of this distinction is valuable as a guide to our active measures of treatment.

Blood Pressure in Pulmonary Tuberculosis. A. B. Marfan[1] has lately had occasion to modify his earlier views concerning the effect of phthisis upon the blood pressure of adults. In 1891 he published observations pointing to the conclusion that the blood pressure was lowered, and that the low pressure was a point in the diagnosis. For those, who, like Huggard and myself, have performed venesection to lower the general blood pressure in cases of persistent hemoptysis and for many who have adopted successfully for the same purpose, Francis Hare's remedy, nitrite of amyl or nitroglycerin, Marfan's original statement was not to be accepted without considerable reservations. He has now recognized that there are many cases of tuberculosis in which the blood pressure is normal, and some in which it is raised. This fact has a special significance in regard to prognosis. He finds that subjects in whom the pulse pressure is high are likely to do well even though they may be liable to hemoptysis, and that it is in those whose pressure is low that the prognosis is most unfavorable.

Buttersack,[2] in commenting upon Marfan's paper, refers to his own views as to a tonic effect exercised by a high blood pressure, which were published in 1902. He believes that the rhythmic shocks conveyed to the organs by a strong systolic pressure tend to raise the organic activities and are thus not only a proof of a good vitality, but a means to its improvement.

Edward O. Otis,[3] in his investigation on blood pressure as a guide in the treatment of hemoptysis, sought to obtain what might fairly be considered a standard of blood pressure among tuberculous individuals. Observations were made in 320 cases in the sanatorium, and the average was found to be 124 mm. Hg. In the men it was 128, and in the women 115. Of 42 male patients the average blood pressure was 126, the highest 140, and the lowest 100. Of 43 female patients the average was 120, the highest 132, and the lowest 98. He therefore considered 126 mm. as the average blood pressure in tuberculosis.

N. J. Strandgaard[4] who has examined hundreds of patients at the Boserup Sanatorium gives a summing up of his review of the whole subject: We need to know more about the individual physiology of blood pressure. It varies like our height and weight. Its rising or falling with healing or progressive lesions suggests that the low pressures are secondary.

[1] Bull. Méd., 1907, No. 90; cf. Revue de Médecine, 1907, No. 11.

[2] Fortschritt der Med., 1908, No. 2, p. 48.

[3] Journal of Balneology and Climatology, January, 1908.

[4] Hospitalstidende, Copenhagen, 1, No. 42, October 16, 1907; cf. Journal American Medical Association, January 11, 1908.

A better oversight might be obtained from the "pulse pressure," as the difference between the extremes of pressure is called, instead of estimating the maximal pressure only.

The blood pressure as a Guide in the Treatment of Hemoptysis. The basis of the judicial consideration awarded by Edward O. Otis[1] to this question is best stated in the words of Flint: "There is a marked difference in different cases with regard to the activity of the circulation, or, to speak more definitely of the heart, as represented by the character of the pulse." And in those of Wilson Fox, who says of ergotine: "It is a remedy which should be used in severe and intractible cases attended by a soft and rapid pulse," or, as we should say now a low blood pressure; and Hare,[2] who speaks enthusiastically of nitrite of amyl, evidently assumes that every case of hemoptysis results from a comparatively increased blood pressure, and reports in 60 cases but 1 partial exception to the rule that "The bleeding ceased or became reduced to a mere staining of the sputa immediately, that is, within a minute or so after its employment."

Finding himself less successful, and wishing for further light upon the value or worthlessness of ergot, Otis began about a year ago to take the blood pressure in cases of hemoptysis occurring at the Massachusetts State Sanatorium, and so far as he was able to guide the treatment by the indication thus given.

In 18 cases, mostly recurrent, the blood tension was taken at, or as soon as possible after, the onset of hemorrhage. In most of them besides the immediate routine treatment consisting of cracked ice, a small or large dose of morphine and atropine hypodermically, according to the urgency, either the nitrites or ergot were employed, depending upon the blood pressure. The physiological action of ergot, as we know, is an "increase of blood pressure in the aortic system by a contraction of the arterioles through stimulation of the vasomotor nerves" and also as Jacobi (quoted by Cushney) has shown, by direct action on the muscular wall of the vessels. Conceivably, then, if hemoptysis were in any instance due to relaxation and transudation, ergot might do good particularly in continued and recurrent hemorrhage (for the action of ergot is too slow to produce immediate results).

In a number of cases, whatever the blood pressure, if the drug indicated by the blood pressure appeared to exercise no beneficial influence upon the hemorrhage he tried that which seemed to be contra-indicated by the blood pressure, and apparently sometimes with success. He states that apparently slight influences, such as mental excitement, physical exertion, the process of digestion, etc., cause the arterial blood pressure to vary considerably within certain limits, and that it is well to take the pressure

[1] Journal of Balneology and Climatology, January, 1908.

[2] British Journal of Tuberculosis, vol. i, No. 1, p. 35.

several times at intervals in order to obtain a fair approximation of the real tension.

Of the 18 cases of hemoptysis the majority were below the average blood tension 126, which he had arrived at from determination in 320 cases in the Sanatorium; some of them markedly so. The highest was 145 and the lowest 74; the average was from 109 to 119. In 11 out of 16 of the reported cases the hemoptysis occurred at night or in the early morning hours. This fact gives us a hint as to treatment, and it appears to indicate that the blood pressure and the sudden variations in pressure are causative factors. Lawrason Brown finds in Howell's theory of sleep some explanation "that sleep is due to the fatigue of the vasomotor centre, and, in consequence, there is a dilatation of the peripheral vessels: when in the early morning hours the vasoconstrictor centre is regaining its lost tone, variations in blood pressure result," and, to prevent this variation and equalize the blood pressure, he gives morphine and sodium nitrite between midnight and 2 A.M.

Otis believes that the treatment by calcium lactate or the chloride, which was employed in several cases, on the coagulation theory, was of small value. Epsom salts were frequently used with apparent benefit, probably due as Babcock says "to the stimulation by the laxative of the splanchnic nerves, which are known to regulate blood pressure throughout the body."

From his general experience and the experience gained in these reported cases, he suggests a plan of treatment of hemoptysis somewhat as follows: On the occurrence of the hemorrhage, ice, morphine, and atropine subcutaneously, and, depending upon the amount and rapidity of the hemorrhage, the inhalation of nitrite of amyl. A laxative dose of sulphate of magnesia, and, if the bleeding persists or is recurrent, nitrite of sodium or nitroglycerin if blood pressure is high for the individual, or, if low, ergot or ergotine subcutaneously, for the latter have apparently proved of value in at least a few cases when other remedies had failed.

DERMATOLOGY AND SYPHILIS.

By WILLIAM S. GOTTHEIL, M.D.

DERMATOLOGY.

Actinomycosis: Primary of the Skin. Primary invasion of the skin by this parasite is so rare that the case recorded by Buerger[1] deserves notice. Less than 17 of the hundreds of cases of actinomycosis recorded have begun in this tissue. In all the cases the observers have noted the resemblance of the skin lesion to tuberculosis, and the actual diagnosis has been determined by microscopic study only. Leser,[2] who recorded three cases, was able to distinguish two main types: The first is marked by the formation of granulation tissue, necrosis, and ulceration; the second is characterized by the appearance of a nodular or papular eruption, with a tendency to peripheral extension and central cicatrization. The affected skin is bluish or violaceous, and the nodules break down to form indolent ulcers or chronic sinuses. The resemblance of this picture to that of tuberculosis cutis is marked.

In Buerger's patient, who was a Russian girl, aged sixteen years, the part affected was the dorsum of the left foot just behind the interval between the third and fourth toes. Here there was an elliptical tumefied mass, 2.5 x 1.3 cm. in size, covered by violaceous and thinned but intact skin, soft and semifluctuating, and surrounded by a slightly indurated zone. The femoral and inguinal glands were not enlarged; a point in the differential diagnosis that several observers lay stress on. The area was circumscribed under cocaine anesthesia, sliced off, and the base thoroughly curetted. No sulphur granules found in the tumor. Only three actinomyces colonies were found in the tumor, and the presence of giant cells was suggestive. The site of inoculation was not found (Fig. 16).

In the case reported to the American Dermatological Association by Zeissler[3] the infection of the skin was secondary through the jaw. Iodide of potassium internally in gradually increasing and finally large doses, with a salve containing 1 per cent. of pure iodine and 10 per cent. of iodide of potash, together with some *x*-ray exposures, was the treatment employed. The patient was discharged cured, at least for the time. The

[1] American Journal of the Medical Sciences, November, 1907.
[2] Archiv f. Klinische Chirurgie, xxxix, p. 722.
[3] Journal of Cutaneous Diseases, November, 1906.

history of the infection was unusually clear. She had been in the habit, the summer before, whilst playing golf, of chewing freshly plucked grass. On one occasion, she remembered, a particle of grain had become lodged under her tongue, causing a slight irritation. Gradually there developed at the spot a somewhat painful and continually increasing swelling in the submental region, which had been lanced twice without effect.

Blastomycosis and Coccidiodal Dermatitis. A good deal of attention has been devoted to the subjects, in previous reviews, the malady having been first recognized and described in this country. So far most of the cases have come from the central parts of the Continent, but very few having been seen in the East. In Europe an occasional case is now being recognized. Oppenheim, of Vienna, read a paper on the subject at the recent International Dermatological Congress in New York.



FIG. 16.—Primary actinomycosis of foot.

The first European case was seen by him in Neumann's clinic in Vienna; later he has encountered three others. The clinical features and pathological findings were exactly similar to the American cases.

Kessler[1] records a case occurring in an infant. The typical instances of the disease have been found mostly in the region of the Mississippi valley and in Chicago; but cases that I believe to be identical have been seen on the Pacific coast and in other places and have been described under the names of protozoic and coccidiodal dermatitis or granuloma. This will be appreciated, I think, by a comparison of Ophuls' picture of oïdium coccidiodes[2] and his description of it with that of the blastomyces by Walker and Montgomery.[3] There are some differences in the reproductive methods, etc., but not enough to justify separation, more espe-

[1] Journal of the American Medical Association, August 17, 1907.

[2] PROGRESSIVE MEDICINE, September, 1906, p. 104. [3] Ibid., 1902, p. 150

cially as the clinical pictures are very similar. Kessler's case was eight months old, and is the youngest on record. I append an illustration of the lesions, and one of the organisms (Figs. 17 and 18).

Another case of systemic blastomycosis has been recorded by Krost, Moes, and Stober.[1] The invasion was more or less acute, rather resembling that of an acute tuberculosis; there was a severe bronchitis, cough, purulent and bloody sputum, evening rise of temperature, night sweats, progressive emaciation, and pain in the affected parts. The course was of seven months' duration, and was marked by the successive development of numerous skin lesions and superficial abscesses. Undoubtedly,



FIG. 17.—Blastomycetic dermatitis. (Kessler's case.)

the authors believe, many cases of the kind have been diagnosticated as tuberculosis, though the ultimate presence of the skin lesions ought to be very suggestive, and the diagnosis is finally readily established by the demonstration of the organisms in the sputum and the pus.

Ten published cases of systemic blastomycosis (eight of them fatal) are summarized and analyzed by Montgomery and Ormsby.[2] Several of these cases have been reported before, and the efforts of the authors are directed to prove that blastomycosis is a clinical and pathological entity.

Ravogli[3] records a case of dermatitis coccidiodes which he differentiates from blastomycosis because the organism resembles a coccidium rather than the blastomyces, the clinical features are somewhat different, and the results of treatment vary from that of the older disease.

[1] Journal of the American Medical Association, January 18, 1908.
[2] Sixth International Dermatological Congress, September 11, 1907. [3] Ibid.

Brayton[1] and Hektoen[2] have considered the relationship of the two diseases. The former is inclined to hold that the diseases are distinct, the blastomyces growing by budding, whilst the oïdium grows by sporulation. Hektoen admits that the organisms occasioning the two diseases are closely related, and that cultures of the two may be almost indistinguishable from one another. The lesions also are extremely similar. It seems to me that in view of the present elementary state of our knowledge of the yeast diseases, and of the further facts that the organisms of the diseases are closely related if not identical, and that the

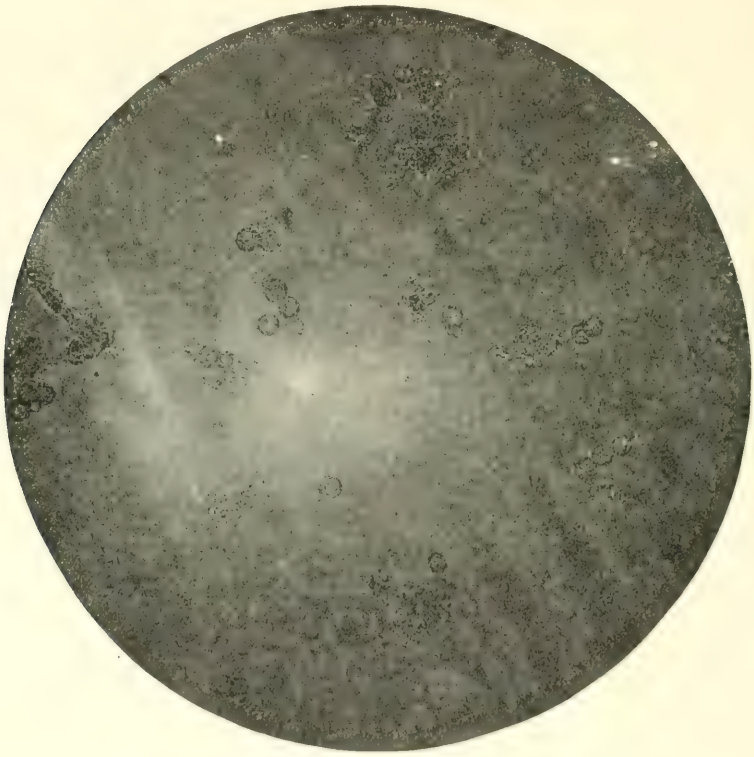


FIG. 18.—Blastomyces organism. (Kessler's case.)

cultures and symptoms are very similar, it would be as well to drop the term coccidiodal entirely, and call all cases of systemic or local yeast infection, blastomycosis simply.

Carbon Dioxide. Pusey[3] has made a preliminary report on the use of the carbon dioxide snow in the treatment of *nevi and other lesions of the skin* as a substitute for liquid air, the objections to and difficulties in

[1] Indiana Medical Journal, May, 1907

[2] Journal of the American Medical Association, September 28, 1907.

[3] Ibid., October 19, 1907.

the use of which are mentioned under that heading; and several other persons have been using it in New York. For eight months past I have been employing it extensively, and I have been so satisfied with the results obtained from it that I keep a tank at each institution with which I am connected, as well as in my office. My experience with it is to the effect that it will do everything that can be accomplished with liquid air, besides possessing many great practical advantages over that agent.

In the first place carbon dioxide, or carbonic acid as it is called, is a commercial product that can be obtained almost anywhere, and can be shipped. It is used in soda-water fountains and for other commercial purposes. It comes in tanks that can be kept indefinitely and the gas drawn as required. If the tanks are tight there is practically no loss. It is extremely cheap; here in New York a large tank costs two dollars and a half delivered; at least 50 and possibly 100 drawings or more can be made from one. In the tanks the gas is under pressure of about 800 pounds to the square inch; but the receivers are carefully tested and are quite safe; in the town here they are regularly kept in the druggists' cellars. In the air the freezing point of the gas is 90° F., about half that of liquid air. Drawn in the ordinary way, with the tank in the upright position, the gas escapes as a light vapor or snow which quickly disappears without leaving any trace of moisture. To obtain it in solid form it must be drawn in a certain way.

The screw cap is removed with a wrench, and a piece of chamois or a towel is wound around the gas orifice in such shape as to leave a space for the snow of the required shape and size. This is then thoroughly bandaged in place, the entire cone being covered and reinforced with plenty of material. The first escaping gas freezes in the interstices of the cover, and the rest, coming out under pressure, becomes a solid mass. By varying the rapidity and intensity of the first jets and subsequent flow a solid mass of any consistency, from a light snow to a very hard and brittle solid mass, can be obtained. I no longer employ the snow moulded in a glass tube or with a spatula, as Pusey first recommended. I draw the carbon dioxide as a solid stick, sufficiently long to afford a good handle, and then cut the end with a knife into any shape desired. One precaution must always be taken. To get a good hard mass the tank must be partly inverted when drawn from, so that the gas opening is lower than the bottom of the tank.

As the gas flows the head fittings become covered with snow, and the consistency of the cone of solid dioxide can be judged by the hardness of the mass. The flow is then shut off, and the bandages cut away. The towel or chamois will be found to contain a solid white chalk-like mass, to which the envelopes are frozen more or less fast. It can be handled cautiously with the naked hand, but must be enveloped in a cloth to be cut or applied. It evaporates slowly in the air at a rate dependent upon the external temperature and the hardness of the cone;

but it lasts quite long enough for all purposes. At ordinary room temperatures in the winter it lasts two or three hours; if put outside or in an ice box it lasts twice as long. My assistants have repeatedly taken pieces from the clinic wrapped in a towel or a piece of newspaper, and carried them long distances in their coat pockets to use at some patient's home.

Applied to the tissues the carbon dioxide acts just like liquid air. The part is immediately frozen, the depth of the congelation depending on the amount of pressure exerted and the time that the agent is allowed to act. For superficial action without visible scarring light pressure for thirty seconds suffices. Where deeper action is required firmer pressure for sixty to one hundred and ninety seconds is appropriate. The reaction and the amount of scarring can be regulated with absolute accuracy. In some three minutes after the application the congelation disappears and is replaced by an erythematous flush; in half an hour or less a blister appears at the place, which dries up in the course of a day or two, leaving an adherent crust which is allowed to fall off by itself. The pain during the application is very slight, owing to the cold; after the freezing wears off there is some throbbing. All kinds of patients, however, have stood the application perfectly well, even when fairly large surfaces have had to be covered. As a rule, however, I limit any single application to one inch square at the most, though I have in some cases treated a number of smaller lesions at one session. Pusey recommends shorter applications than I employ, to be repeated if necessary on the same area.

As to the diseases to be treated with this agent I can mention in the first place nevus in most of its forms. In the ordinary telangiectasis or port-wine stain the milder application-form suffices, and successive areas can be treated at intervals of about two weeks. The same holds true of the superficial pigmentary nevi. For the deeper hairy or pigmented moles more energetic action is required, and the same is true for the elevated and verrucous nevi. It is perfectly possible to destroy the entire thickness of the skin. Senile and other warts, lupus erythematosus, and acne atrophica are other conditions in which I have used the method with good results. In the deeper-seated and cavernous angiomata it is not possible to destroy the tumor by this means, but I have obtained results in two cases that were satisfactory to the patients at all events. A moderately intense application of the ice has resulted in the formation of a smooth layer of white scar tissue over the vascular mass, which has taken away or rather masked most of its color and has rendered the deformity much less unsightly.

I can heartily recommend this therapeutic method to the practitioner. The material is readily obtainable; it is not even necessary to procure a tank; the cylinder of CO_2 can be drawn from at the druggists and the material carried to where it is to be used. The small amount of skill required to draw it successfully is soon obtained, and I believe it to be quite safe. I should advise its use cautiously; of course, at first, until

the operator has familiarized himself with it, the applications should be light and of short duration. It gives us a means of treating successfully a number of cases that are otherwise very difficult to cure, and I regard it as a distinctly valuable addition to our means of relieving deformities of the nature stated.

Dermatological Diagnosis. A number of suggestions in aid of dermatological diagnosis have been made during the year. Jullien[1] employs a 2 per cent. *chromic acid solution,* which does not stain normal epithelium, whilst tissues that have been robbed of this covering by any pathological process are colored an intensive yellow. This enables one to determine with exactitude the external form and characteristic features of many affections of the skin and mucosæ. It is useful for doubtful herpes of the genitals, mucous patches of the female genital mucosæ, chancroidal ulcerations, etc., all of which lesions are deeply colored. In the mouth the color attacks mucous patches and aphthæ. In the genital and the anal region the solution enables us to differentiate between purely erythematous and ulcerating and eroding processes with precision.

Curettage is employed by Brocq[2] as a diagnostic help in certain cases, the author claiming that to a certain extent it replaces a microscopic examination. He uses a modified curette instead of the finger nail for the purpose. In *psoriasis,* for instance, careful grattage shows first the mother-of-pearl-like scales, under this is a delicate membrane which can be removed in lamellæ, below this again a reddened surface exuding serum, and, finally, on further scraping appears blood. These appearances serve to differentiate the true psoriasis from the psoriasis-like eczemas and seborrheas. In pityriasis rosea a slight purpura and the exudation of a drop of serum follows the grattage. In lichen planus the papules get turgid under the test, and a purpuric ring appears at their borders. In lupus erythematosus the scales are tightly adherent, and hemorrhages occur very readily under the scraping. Scraping a papulosquamous syphiloderm causes a faint purpura, and then the tumor formation is plainly visible.

Leslie Roberts[3] attempts by means of a study of the lines of growth of the various efflorescences to establish differential diagnostic points in the various skin affections. His argument is too technical for adequate abstraction here. Suffice it to say that there seems to be reason to believe that the way in which the individual lesions of various dermatoses grow in size is in some cases, at least, quite characteristic; and the method may, when developed, simplified, and popularized, be of considerable value to the dermatological student.

Horaud[4] has employed gentle *venous compression* to render the

[1] Monatshefte f. praktische Dermatologie, March, 1907.

[2] Annales de Dermatologie, 1907, No. 5.

[3] British Journal of Dermatology, May, 1907.

[4] Lyon médical, June 24, 1906.

lesions of a roseolous eruption, that looked hardly suspicious, more plainly evident. Under elastic pressure the lesions became red, copper colored, and livid. Compression is made with an elastic band proximal to the part to be examined. The venous compression fills the capillaries and congests the territories to which they are tributary, and the lesions stand out plainly.

Drug Eruptions of the Commoner Kinds. This subject has not been referred to in these pages since the review of 1901.[1] Several articles have appeared on it during the last year or so, amongst which I may mention those of Engman and Mook,[2] Hoffman,[3] G. G. Campbell,[4] and my own.[5] The importance of recognizing them is very evident. Some of them resemble the exanthemata; others look like certain forms of syphilis, tuberculosis, and other chronic infections of the skin, etc. Occurring, as they do, in individuals under medicinal treatment, they are very liable to be mistaken for independent affections. No general rules can be laid down for their recognition, and therefore any assistance that we can get to this end is of value.

Engman and Mook have studied the histopathology of the iodine and bromine eruptions, and have come to the following conclusions:

1. The local eruptions are prone to occur at points of previous inflammation, about comedones, acne lesions, seborrheic patches, scars, traumata, etc.

2. Traumata, pressure, rapid temperature changes, or any local irritation may precipitate an eruption in the tissues charged with the drug.

3. Idiosyncrasy is potent, as in other toxic conditions.

4. The glands or follicles of the skin take no active or specific part in the production of the lesions; when they are involved it is secondary to inflammatory changes in the vessels and connective tissue.

5. The histological changes in the skin vary from the slightest vascular ones to abscess formation and death of tissue.

6. The increased leukocytosis, and the degenerative change that mark the inflammation, are due to the local disturbance of the normal equilibrium between the iodine and bromine combined in the serum and the tissues.

7. The product of this disturbed equilibrium acts as a toxin which causes tissue irritation, the exact form of reaction which this latter occasions being dependent upon individual peculiarities, as in other toxic conditions.

This theory is called by Engman and Mook the "rational" one, as it explains all the symptoms of iododerma and bromoderma in a purely

[1] Progressive Medicine, 1901, p. 155

[2] Interstate Medical Journal, November, 1906.

[3] Journal of the American Medical Association, December 28, 1907.

[4] Ibid., December 7, 1907.

[5] Archives of Diagnosis, April, 1908.

chemical and mechanical way, and does not depend in its elucidation on the mysterious and purely theoretical action of the vasomotor system.

Campbell divides all drug eruptions into two types: the first is the morbilliform, including antipyrine, antitoxin, belladonna, copaiba, cubebs, opium, sulphonal, tar, and turpentine; the second type is the scarlatiniform, and comprises antipyrine, antitoxin, belladonna, chloral, copaiba, cubebs, quinine, sulphonal, salicylates, and turpentine. I only have this paper in an abstract in another journal, and cannot therefore vouch for its accuracy; but assuming it to be correct the classification is of little use, if for no other reason because many of the drugs appear in both lists. In fact the first point that I make in the article above mentioned is the fact that no satisfactory classification of these eruptions can possibly be made. Polymorphism is an essential feature; one and the same agent may cause lesions in different cases, or even in the same case at different times, that vary very greatly in appearance, distribution, and course. This is the rule, although there are notable exceptions to it. Such are the black-point-tipped lesions of a tar acne, the scarlatina-like eruption from belladonna, and the morbilliform exanthem from copaiba. These are fairly constant phenomena, yet even the copaiba eruption, for example, may be urticarial, vesicular, bullous, or even petechial. Neither on a symptomatic, nor on an etiological, nor on a pathologico-anatomical basis can any satisfactory classifications of these eruptions be made.

The only practical division is based on the mode in which the causative agent gains access to the tissues. We may class under the heading of dermatitis venenata the reaction caused by a number of agents, which when applied to the skin, regularly or occasionally, cause a definite reaction in the skin beyond the area to which they are applied, or even in the entire integument. Leaving out of account such agents as the mineral acids, caustic alkalies, whose action is mechanical and chemical rather than medicinal, the long list of drugs that may act in this way includes, staphysagria, turpentine, tar, croton oil, oil of cade, chrysarobin, pyrogallol, salicylic acid, carbolic acid, iodoform, hyoscyamus, mercury, digitalis, chloral, camphor, cantharides, belladonna, balsam of Peru, arsenic, arnica, antimony, sulphur, and lead, as well as the active principle of the poison ivy and poison oak. Drugs causing skin eruptions when taken internally form an equally long list; they are best classed under the heading of dermatitis medicamentosa, and include digitalis, turpentine, stramonium, santonin, ergot, hyoscyamus, phosphorus, lead, cold-liver oil, chloral, cannabis indica, calcium sulphide, acetanilid, antipyrine, antimony, tannic acid, aconite, salicylic acid, nitric acid, carbolic acid, benzoic acid, and morphine, as well as the better-known dermal reactions that follow the internal administration of quinine, copaiba, arsenic, bromine, belladonna, silver nitrate, and iodine.

In spite of the varied phenomena that these drugs occasion in the skin, the eruptions have certain definite earmarks even when they do not

assume a form characteristic of one or other of the drugs mentioned, which would lead us to suspect drug intoxication as the cause of a local or general efflorescence. These are:

1. *Polymorphism.* Whilst on the one hand certain drugs have characteristic eruptions, of which the acne of the face and trunk of iodine, the tuberous exanthem on the face and legs of bromine, and the measles like general eruption of copaiba, are examples, the occurrence of lesions of different kinds in one eruption should lead us to suspect the action of a drug. Thus we see urticarial lesions, papules, vesicles, and even bullæ in the mixed eruptions from many drugs. The occurrence of any eruption of an anomalous type, or any exanthem in which the lesions are mixed and indefinite, should lead us to consider this possibility.

2. *Rapidity of Development.* Whilst occasionally the drug eruption causes only after long-continued use of the medicament, it sometimes appears so quickly that the relationship between the two occurrences is evident. Especially is this true of the urticarial and acute vesicular exanthemata. General urticaria may follow in an hour or two the administration of a dose of quinine or antipyrine; acne may appear after a single day's iodine administration. Where it is available, this feature of the drug eruptions is very valuable in helping us to arrive at a diagnosis.

3. *Etiology.* This is naturally an important element in the diagnosis, yet it may readily lead us astray. The post hoc ergo propter hoc fallacy lies in wait for us. Drugs that are notoriously apt to cause eruptions, like belladonna, antipyrine, chloral, quinine, etc., internally, and iodoform, chrysarobin, mercury, cantharides, and the like externally are more open to etiological suspicion than others that only exceptionally set them up. In some cases the skin lesions are so characteristic that there is little liability to make a mistake, as in the diffuse dark staining of argyria, the acne from iodine, the keratosis from arsenic, the tuberous exanthem from bromine, etc., in the internal, and the folliculitis of mercury, the erythema of chrysarobin, and the dermatitis from carbolic acid in the external class. But in other cases the skin lesions are not characteristic, as in the urticarias from antipyrine and chloral, or the lesions occasioned by arnica or balsam of Peru. A characteristic eruption following medication is decisive; a non-characteristic one only presumptive evidence of the etiology. The experimental test is often employed, but is not always reliable. I have seen an undoubted bromoderma tuberosum in which subsequent administration of the remedy was not followed by recrudescence of the skin lesions.

4. *Idiosyncrasy.* This is so marked a factor that with the commoner drugs the patient himself not infrequently knows of his susceptibility. I have learned by experience to lay considerable stress on patients' statements; they are often based on repeated experiences. Some patients cannot take quinine or chloral at all without an urticarial outbreak, and

I recently saw a case in which mercury in any shape at all, and in any form of administration and dosage, occasioned a violent hemorrhagic exanthem. Given the idiosyncrasy, almost incredibly small doses may cause the reaction. I have known two 2 gr. doses of potassium bromide cause a tuberous eruption in an infant, and 3 gr. of iodide of potassium cause a marked acne in an adult.

5. *Location, Extent, Course, and Duration.* These factors may be of some help in the diagnosis. Thus eruptions due to external reagents are more or less confined to the area subjected to their influence, and are always more marked there. Some internally administered drugs react in certain localities; thus argyria is most marked on the face and hands, the parts exposed to the light; the iodine acne appears mostly on the face and back where the sebaceous glands are most developed; the copaiba erythema is most marked on the abdomen and back, etc. The dermatoses, due to the external application of drugs, are usually more or less localized in area; those from internal administration are usually generalized. The erythematous, urticarial, and vesicular lesions from quinine, chloral, copaiba, etc., are usually acute and fugacious; whilst the tuberous lesions from bromine, the keratosis from arsenic, the argyria, etc., are notably recalcitrant, and, perhaps, permanent lesions.

6. *Morphology.* From what I have said it is evident that in many cases the external characters alone are of minor value in the diagnosis of these eruptions. Nevertheless, a list of the more usual reactions occasioned in the skin by the various drugs may be useful:

(*a*) Boric acid. Externally used, general erythema.

(*b*) Carbolic acid. Externally, dermatitis of varying intensity, even going on to gangrene.

(*c*) Chrysarobin. Externally, hyperemia, erythema, and a papular pustular furunculoid, or erysipelatous dermatitis.

(*d*) Pyrogallol. Externally, dermatitis of varying severity, even to ulceration and sloughing.

(*e*) Salicylic acid and the salicylates. Externally, vesicular eczema; internally, general erythema, and urticarial, papular and even petechial eruptions.

(*f*) Bromine and the bromides. Internally, acne most commonly; less frequently a tuberculous eruption on the extremities and face. Rarely an urticarial erythematous, or furuncular general eruption.

(*g*) Iodine and the iodides. Externally, dermatitis of varying grade; internally, acne commonest; a tuberous eruption, on the extremities, rarer. Occasionally an erythematous, papular, urticarial, vesiculobullous or even gangrenous exanthem.

(*h*) Sulphur. Externally, a general papular or scarlatiniform eruption; eczematous inflammation.

(*i*) Tar and its compounds. Externally, an acneiform, papular, or vesiculopustular eruption.

(*j*) Morphine and its congeners. Internally, pruritus, general erythema, rarely an urticarial or papulovesicular eruption.

(*k*) Iodoform and its congeners. Externally, acute dermatitis of varying severity.

(*l*) Mercury and its compounds. Externally, dermatitis, and especially a suppurative folliculitis of the hairy parts; a general eruption of scarlatiniform, hemorrhagic, or even gangrenous type; internally, may cause the same lesions.

(*m*) Copaiba. Internally, a papulovesicular general eruption often resembling German measles.

(*n*) Cinchona and its alkaloids. Internally, urticarial, erythematous papulovesicular, bullous or petechial efflorescences; scarlatiniform rash commonest.

(*o*) Chloral. Internally a general erythematous, papulovesicular or petechial rash.

(*p*) Belladonna and its derivatives. Externally and internally a fugacious scarlatiniform rash; more rarely a papulovesicular eruption.

(*q*) Balsam of Peru. Externally, an eczematous eruption or a dermatitis.

(*r*) Arsenic. Externally, intense inflammation going on even to gangrene; internally, an erythematous, papular, urticarial, pustular, or ulcerative eruption. Brown pigmentation of the skin, localized or diffuse. Localized keratoses. Carcinoma.

(*s*) Silver salts. Internally, diffuse grayish to steel-black permanent pigmentation, especially on the exposed parts.

(*t*) Antipyrine and its congeners. A general fugacious urticarial eruption.

Impetigo. This subject has not been referred to in these pages since the issue of 1902, when the researches of Cassarini, who found most of the cases due to the Staphylococcus aureus, were referred to. At that time it seemed probable that some definite information would be obtained as to the role played by the pus organisms in the etiology of skin diseases, the various forms of pyogenic organisms occasioning the different kinds of folliculitis, impetigo, furuncle, carbuncle, etc., whilst their toxins alone occasioned eczema. The researches of Bender, Bockhart, and Gerlach[1] in this latter matter have, however, not been confirmed; and we are almost as much in the dark today as we were six years ago in regard to the etiology of the commonest of all skin diseases.

As regards impetigo, however, we can formulate certain definite conclusions. The subject, like that of lichen, pemphigus and others, suffers from the confusion incidental to a malady whose exact boundaries and variations are still undecided. Whilst certain definite maladies are generally accepted as impetigo, there are others in which there is a question

[1] Progressive Medicine, 1902, p. 176.

between it and such apparently different affections as ring-worm on the one hand and pemphigus on the other. Further, the zeal for differentiation on the part of certain observers, notably Unna and his school, has led to the proclamation of a number of subvarieties of the disease to the further confusion of the student. Whilst one or two quite recent investigators like Bender[1] still hold that the ordinary pus cocci are not the cause of impetigo. Block[2] better represents the present dermato-

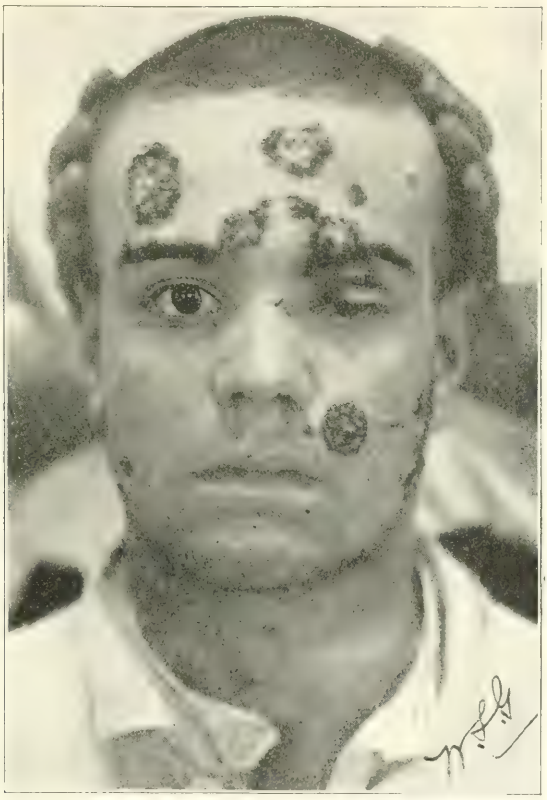


FIG. 19.—Impetigo contagioso. (Author's case.)

logical standpoint in holding the contrary. The following resume of my own is based on the latest authorities, and may be taken as representing the state of our knowledge of the subject at this time.

1. Impetigo is accepted as the name for a class of more or less infectious diseases of the skin characterized by the appearance of superficial vesicopustules drying up into honey-like crusts, each lesion running a definite course, leaving a stain but no scar, occasioned by the pus

[1] Archiv f. Dermatologie und Syphilis, April, 1907.
[2] Die Praxis der Hautkrankheiten, Berlin, 1908.

organisms and sometimes eventuating in the deeper pus infections of the integument.

2. Varieties. (*a*) *Impetigo Contagiosa*, or *Impetigo Vulgaris*. The most frequent form of the disease, seen oftenest in the neglected children of the poor, and in summer, occurs mostly at sites exposed to irritation and kept moist, as around the lips and nose, near a discharging ear, with scabies, urticaria, impetiginous eczema, etc., appears as flat, discrete, vesicopustules, usually on the face and the exposed parts; rare on the covered body and itches considerably. Is sometimes grouped and in rings; a circinate form appears when the older central lesion has retrogressed, or when a single lesion sinks at the centre whilst extending at the periphery. Definite course, lasting about two weeks, for each lesion; indefinite course (from reinoculations) for the whole disease. Never eventuates in deeper skin infections (furuncles, carbuncles, etc.). Affects children almost exclusively, though the circinate form has often been seen in adults. The milder forms of the so-called impetigo neonatorum are really cases of impetigo contagiosa. The affection has been known under this latter name since the time of Tilbury Fox.

(*b*) *Impetigo Staphylogenes* (Bockhardt). Globular vesicopustules appearing so quickly that the lesions are usually pustular when first seen, and have a narrow red border. Grow to pea size or larger; last ten to fourteen days. Rupture or dry up into honey-like crusts composed of the upper corneous layers; dried serum and pus crusts fall off, leaving a round, moist depression in the epidermis. Oozing seropus may cause reformation of the crust; no scars. Often leads to hair-follicle infection, folliculitis, furunculosis, and other deep infections. Site: trunk, where the clothing rubs, especially neck, waist, forearm, lower legs, etc. Rare on the face and hands, but may be inoculated anywhere. Lasts indefinitely.

(*c*) *Impetigo Herpetiformis* (Hebra). Affects women almost exclusively, usually occurring at the end of pregnancy, less frequently during the puerperium or in connection with uterine disease; is very rare. A pustular eruption begins in the genitocrural region, and spreads over the body being especially marked in the mammary region and on the buccal mucosa. General infection, fever, chills, etc. (sepsis). Fatal in over one-half the cases in the first attack; liability to other and usually fatal attacks in subsequent pregnancies. Has been claimed by Duhring as a variety of dermatitis herpetiformis; a perfectly distinct clinical entity and usually classed under the impetigoes, but I question whether it does not rather belong in the pemphigus group.

3. Etiology. The ordinary staphylococcus is recognized as the causative agent of all the varieties of impetigo. The differences from the usual pus organisms that Unna and some others have claimed to exist, and which has led them to describe an independent organism, are not recognized by Matzenauer, Kreibich and most of the other investiga-

tors. Sabouraud's claim for the streptococcus as the cause is not accepted.

4. Pathology. Impetigo in all its forms is caused by a staphylococcic infection of the epidermis alone, without involvement of the lanugo, hair, or sebaceous follicles, though infection of the latter may occur secondarily. A superficial unilocular, non-umbilicated vesicle is formed; the exuded serum is indistinguishable from that of eczema; no scarring occurs.

5. Prognosis: Good in all save in impetigo herpetiformis.

6. Treatment: For ordinary impetigoes, impetigo contagiosa, impetigo staphylogenes, etc.

(*a*) Remove crusts gently, but repeatedly; they contain pus cocci in abundance.

(*b*) Disinfect base of pustules with tampons soaked in 1 per cent. bichloride solution.

(*c*) Use a desiccating paste, as sulphur, 10 per cent.; zinc oxide, 10 per cent.; kaolin, 10 per cent. in unguent. aq. rosæ, with perhaps 2 to 5 per cent. of ichthyol added. Or use white precipitate ointment, 1 to 3 per cent. for younger, and 2 to 5 per cent. for older children.

For the severer and more generalized forms, impetigo herpetiformis, impetigo neonatorum, and the other impetigoes that are apparently general infections:

(*a*) Isolation.

(*b*) Hot baths, especially with oak bark (500 grams to 4 liters of water); starch baths.

(*c*) Ointment treatment as for the commoner forms.

(*d*) General symptomatic treatment.

Liquid Air. Interest in this therapeutic agent has been stimulated by the interesting exhibition given before the late International Dermatological Congress by Dade, when the method of employing it was demonstrated and a series of cases with remarkable good results for its use was shown. Among the articles upon it that have appeared during the year I may mention those of Gold,[1] Whitehouse,[2] and Trimble.[3] As long ago as 1893 liquid air was obtained by Tripler, but the attempts of the original makers to exploit the product by means of a stock company and the very great difficulties in the way of obtaining and keeping it, together with the expense involved, has stood in the way of its general employment. At the present time it can be obtained in New York, but not with certainty; the container that each user must supply is costly; it cannot be kept more than four days or so; and the liquid air itself is so expensive that it cannot be used in ordinary practice. The few who

[1] Pacific Medical Journal, June, 1907.

[2] Journal of American Medical Association, August 3, 1907.

[3] Journal of Cutaneous Diseases, September, 1907.

do use it accumulate a number of patients for a certain day on which to apply it.

Liquid air has a temperature of 220° F. and evaporates instantaneously when thrown upon the floor, sputtering like water when thrown upon a hot stove, and causing intense cold in everything around it. It is kept in a Dewar bulb, which is a double-silvered vessel with a vacuum between the two coats, and with the outer bulb covered with a heavy felt jacket. The only stopper that can be used is one of cotton or light tissue paper; tightly corked the bulb collapses, with loss of the contained liquid air. There appears to be no danger attached to its use, provided the above precaution is employed. The air is best applied with a swab on a long handle, being put directly in contact with the part to be treated and held on with variable pressure for ten or fifteen seconds.

All the tissues are immediately frozen solid; the harder the pressure, and the longer the time of application, the deeper the effect. The treated area is pearl white in color, absolutely hard, and entirely insensitive. In from one to three minutes after the application the tissues have apparently returned to their former condition save for a slight redness, but within an hour there forms a large blister, filled at first with a clear and later with a turbid serum. If allowed to remain untouched, this dries up in a few days into a thick heavy scab, which when it falls off leaves a clean, smooth white scar. The pathological changes occasioned are those of dry gangrene. Most of the patients complain of more or less pain immediately after the freezing; and the burning and stinging may last for several hours. I can testify, however, that the patients to whom I saw Dade apply the air stood it without any difficulty; some of them were women, and all of them, I believe, had had the air applied before, and knew what to expect.

Gold's conclusions as to its use are as follows: In epithelioma he is undecided as to its usefulness, though he has seen one of the inner canthus cured and remaining so for one year. In *lupus erythematosus* he considered it deserving of trial; he records at least two cases cured. It is in *nevus* of various forms, however, that it is most useful. Vascular, hairy, and pigmented nevi have all been cured by its application.

Whitehouse calls special attention to the vital importance of technique in using this agent, the elements governing the effect produced being: (1) The degree of saturation of the swab; (2) the accuracy of contact; (3) the amount of pressure exerted; and (4) the duration of the exposure. An additional element to be considered is the length of time between the applications; this should be long, giving time for the reaction from one application to subside before making another. In conditions like lupus erythematosus and port-wine stain a light pressure of short duration, to produce superficial freezing, is indicated. In pigmented and hairy nevi, angiomata, lymphangioma, and lupus vulgaris a medium pressure and for longer time should be used. In rodent ulcer and epithelioma

very firm pressure for a considerable space of time is required. The reader is referred to the original article for the details of the treatment.

Whitehouse reports eight cases of nevus: two of lupus erythematosus, and two a lupus vulgaris with excellent results, and also fifteen cases of cutaneous cancer treated in this way with generally satisfactory results. He concludes that whilst the field of liquid air is undoubtedly limited, we can do better with it in pigmented, hairy, and vascular nevi, in lupus erythematosus and vulgaris than with the older methods. In epithelioma also it is distinctly a power for good.

Trimble confines his remarks in the paper cited to the action of the liquid air on the black hairy mole, and records some eight cases in which it was successfully employed. The freezing was deep enough to destroy the hair.

These results, of course, are very satisfactory; but there are certain very obvious remarks to be made, more especially in a criticism that is intended to guide the practitioner living in regions possibly remote from the great centres. Even in New York, as Trimble admits, liquid air can only be obtained at very long and irregular intervals. It is extremely expensive as a therapeutic agent, and it cannot be kept. For some of the affections mentioned we have other older effective and readily procurable means of treatment. The case that Trimble figures in his article, for instance, is apparently one that could have been treated by excision, the cautery, or electrolysis. Some of Whitehouse's epitheliomas were apparently very suitable cases for destruction by means of caustics. Over and above all these considerations, however, we have another means of getting all the effects that are obtainable from liquid air, and a means that is very cheap, readily procurable, keeps indefinitely, and which, being a solid, can be much more easily handled and applied than liquid air. I refer to the solid carbon dioxide, to which a previous section of this review is devoted.

Lupus Erythematosus. It is several years since this subject was last referred to in these pages;[1] some consideration of the work done in this difficult field will therefore be appropriate.

I cannot say that we have arrived at any definite conclusions as to the nature of the disease, in spite of much painstaking work. Since Besnier, in 1881, first affirmed its tuberculous nature, authorities have been divided on the subject. The *Annales de Dermatologie*, of Paris, has lately[2] instituted a sort of international consultation on this and other moot subjects in the specialty, and they find the tuberculous nature of the affection denied by a majority of authorities. Without going into the lists of names, 16 teachers believed it tuberculous; 26 did not hold that opinion; 7 held that certain cases of lupus erythematosus were tuberculous, and 8 did not feel that they could give a definite answer.

[1] Progressive Medicine, September, 1904, p. 124.

[2] Annales de Dermatologie, 1907, No. 4.

The advocates of the tuberculous nature of lupus erythematosus based their opinion chiefly on the following facts: The disease appears almost exclusively in tuberculous patients, or in descendants of tuberculous patients; many patients affected with it become phthisical later, or show tuberculous foci on autopsy; the tuberculin reaction is often positive, and the tissues often show histologically a tuberculous, or, at least, a tuberculoid structure. Their opponents claim the tuberculin reaction is seldom positive; giant cells demonstrate nothing; artificial tuberculosis has never been induced in animals by lupus erythematosus inoculation, etc. In a third group some say that the chronic, others that the acute, forms are tuberculous; whilst other writers specify some individual forms as being of tuberculous nature. In point of fact the only conclusion that the unprejudiced observer can come to is that the disease is not tuberculous. The absolute non-success of attempts at histological proof of tuberculous nature, and of attempts of inoculation proof, as against such unreliable things as the tuberculin reaction and the patients' history, to my mind settle the question so far as our present knowledge goes. Lupus erythematosus is apparently not a tuberculous disease.

The frequency with which lupus erythematosus occurs has been variously estimated. According to the records of the American Dermatological Association it appears once in 300 dermatological cases. On the other hand Voirol reports it as once in 833 dermal cases in Berlin, and Heidingsfeld[1] has found it as frequent as 34 per cent. in his private practice.

The *treatment* of this obstinate affection is the point that interests the practitioner. Brocq[2] lays stress on the importance of open air in a warm or temperate climate; in the tropics the disease is unknown, which he attributes to the strong sunlight. In the superficial forms it is important to avoid all congestions of the face, such as are occasioned by the use of alcoholics, etc. Internally he employs arsenic or carbolic acid, 0.01 (gr. $\frac{1}{6}$) per diem, or quinine, 0.5 to 1 (gr. $7\frac{1}{2}$ to 15) twice daily; he has seen very good results from all three of these remedies. Externally he favors cauterization, at first chiefly at the advancing margins; scarification is his second choice.

Heidingsfeld[3] employs a varied therapy. In the acute disseminated form, with general symptoms, bland palliative applications are often successful. For the more chronic forms any one of the multitude of procedures are recommended: freezing, scarification, and cauterization may be employed. In the worst chronic discoid forms, where all other methods fail, he advised surgical extirpation. Rosenthal advocated this as early as 1892,[4] as did Ricketts in 1893;[5] and the method has been

[1] Journal of the American Medical Association, September 7, 1907.
[2] Journal des praticiens, 1907, No. 1.
[3] Loc. cit.
[4] Dermatologische Zeitschrift, No. 9.
[5] Transactions of the Pan-American Medical Congress, 1893, 11.

followed by Leredde, Hallopeau, and Neisser.[1] Excision presents its own difficulties on account of the soft and friable nature of the tissues involved, but done with care and neatness it seems to give good results.

Hartzell[2] some years ago recommended freezing with ethyl chloride, concluding as the result of his experience that in not a single case in which he tried it did it fail to effect a distinct and marked improvement. In fact he recommends repeated refrigeration in conjunction with large doses of quinine internally as the best general treatment for this intractable disease.

For years past I have employed *trichloracetic acid* in the treatment of lupus erythematosus, and I considered it, until this last year, the best local measure at our disposal. A very small, moist, cotton swab is dipped into the bottle of crystals, and the deliquescing particles are rubbed into the area affected with a varying degree of pressure and time. Great care must be taken to prevent the drug acting outside the area to which it is applied; if any of the fluid runs down onto the healthy skin, cauterization and superficial scar formation ensues. A white slough forms, which in the course of a few days turns dark, and in two weeks or so comes off leaving very superficial and non-deforming areas of scar tissue. Applications should be made once in every two or three weeks, after all reaction from the previous application has ceased. There is some pain, lasting for two hours or more, but not more than my patients have willingly borne. Since the inevitable ultimate result of the lupoid process is cicatricial tissue formation, I have not hesitated to cause it to appear. The results of the treatment have been good; on some cases it has failed like all other methods, but it was the best means at my disposal.

Last fall I commenced using the solid *carbon dioxide* on these cases, freezing from one to six areas at a session, and repeating the process every two weeks or so when the reaction had disappeared. The results have been so very encouraging that I do not hesitate to recommend the process as far superior, in most cases, to the use of trichloracetic acid. For the details of the method the reader is referred to the article on this agent in the present review. The pain is considerably less than that of the other application, largely on account of the cold anesthesia effected by the agent. Areas as large as a dime can be covered, and as many as five or six can be treated at one time. Moderate pressure for some thirty seconds is usually required. Large blisters form which rupture or desiccate, and the ultimate result is all that can be required. A layer of extremely superficial, pliable, whitish scar tissue replaces the lupoid infiltrations.

Negro Skin Diseases. It has always been a matter of wonder to me that this subject has not been taken up exhaustively in the past by someone of our Southern confreres who have abundant opportunities for observa-

[1] Annales de Dermatologie, 1898, p. 262

[2] Journal of the American Medical Association, December 31, 1907.

tion in that line. Among the foreign members of the International Dermatological Congress that was held in New York in the fall of last year, it was one in which great interest was manifested; I might say that it was one among the few about which they expected to receive rather than to impart information. This country, with its ten millions or more of negro and mixed population, is better qualified than any other for the elucidation of the problems presented. And problems there are, as all who have had occasion to do clinical work in institutions with a colored clientele will admit. I worked for many years in a dispensary located in a district with a large negro population, and I found the difficulties of diagnosis often almost insuperable. The changing and masking of the color in all cases, and, especially, in those with deeply pigmented skins deprives us of one of the main criteria in our judgment of the nature of dermatoses.



FIG. 20.—Keloid in a negro. (Howard Fox's case.)

The paper that Howard Fox[1] read on this subject was statistical and based on figures collected from various sources rather than from personal observation; the records embraced over 5000 cases. Fox rightly calls attention to the fact that the inquiry is rendered harder by the fact that all patients, even those with only one-eighth colored blood in them, are invariably grouped together in our institutions. Nevertheless the paper is of great interest, since, with the exception of that of Morrison, who compared 500 cases of skin disease in negroes with an equal number of whites, it is the only one on the subject. Further difficulties, in the way of an inquiry such as this, are caused by the facts that the negro is not so apt to consult a physician for a skin disease as is a white man, the obvious disfigurement being often much less, and that they are exceedingly

[1] Journal of Cutaneous Diseases, February, 1908.

unreliable in all statements concerning their disease and their personal history, and are very difficult to keep track of and hold under observation. Fox's conclusions are as follows:



FIG. 21.—Keloid in a negro. (Howard Fox's case.)



FIG. 22.—Lichen rubri in a negro. (Howard Fox's case.)

1. In spite of the fact that the negro is more susceptible to disease in general than the white man, and that his mortality is twice as great, he suffers less frequently and less severely from disease of the skin.

2. The negro skin is decidedly less susceptible to external irritants.

3. The full-blooded negro is almost immune to ivy poisoning.

4. Acne is less common and less severe in the negro. Rosacea is a rare and very mild affection. Eczema is perhaps not less frequent though certainly less severe. Psoriasis in the full-blooded negro is very uncommon.

5. Tuberculosis of the skin is not more common in the negro in spite of the great prevalence in this race of pulmonary and other forms of tuberculosis.

6. The negro is more subject to new-growths of connective-tissue origin, and less to those originating in epithelial structures. Cutaneous epithelioma is very rare in the full-blooded negro.

7. The mucous membranes, as well as the skin, are less susceptible to disease. Leukoplakia is seen in the negro with extreme rarity.

8. Many of the rarer forms of skin disease are observed in the negro as well as in the white race.

9. Mulattoes are more susceptible to skin diseases than negroes, being especially prone to chloasma.

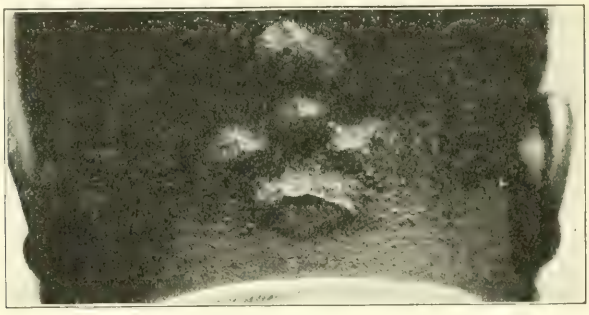


FIG. 23.—Dermatitis papillaris capitelli in a negro. (Howard Fox's case.)

These conclusions agree in the main with the impressions that I have formed on the subject. Of especial interest is the great commonness of keloid, leukoderma, and lichen planus in the negro, and the rareness of cancer. I have seen but two or three cases of epithelioma in colored people. This latter fact is of importance in connection with the researches lately made by Hyde on the influence of light in the production of cancer of the skin, and the protection therefrom afforded by the pigment. The entire subject is of interest, and I would suggest further inquiry into it, based on observations on pure negroes in the first place and on persons of mixed race in the second.

Opsonic Therapy in Skin Diseases. Although this subject is still in the experimental stage, and the therapeutic method is not yet at the disposal of the practitioner, it has excited very general interest, and a brief account of it from the dermatological standpoint may be of interest.

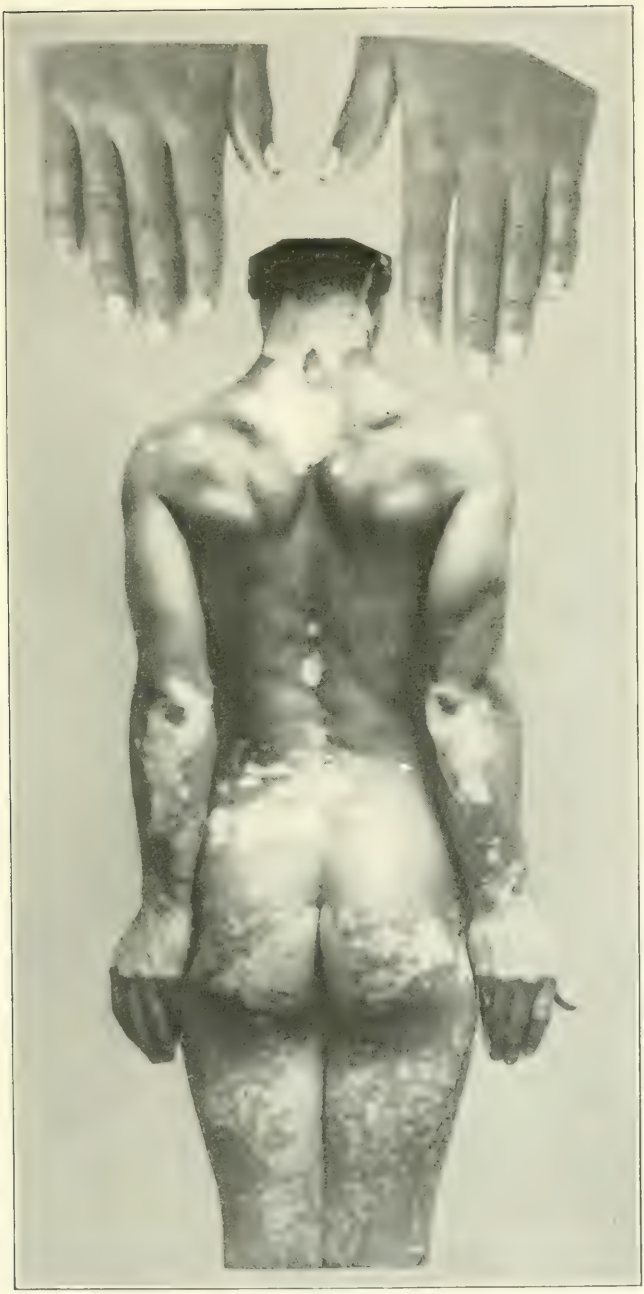


FIG. 24.—Leukoderma and leukonychia in a negro. (Howard Fox's case.)

Varney[1] and Alderson[2] have contributed quite elaborate articles on the subject. Varney employed Wright's later method, with a few slight modifications of his own:

1. A pure culture of the causative microörganism, or in a mixed infection of the microörganisms, was isolated.

2. Estimate was made of the opsonic power of the patient's blood to this microörganism before any vaccination was given.

3. A vaccine was prepared and standardized from the microörganism.

4. The patient was inoculated with this vaccine, with varying dose at indicated intervals, determined only by the systematic estimation of the opsonic contents of the patient's blood. The ordinary technique was employed to measure the resisting power of the patient, or to discover the opsonic index.

A series of cases of acne, furunculosis, and sycosis were treated by the method, and with what Varney considers to be very satisfactory results.

In the discussion that followed the reading of Varney's paper in the Cutaneous Section of the American Medical Association at Atlantic City, Zeissler very properly dwelt upon the fact that so long as the opsonic method was so complicated, and so long as it was necessary to determine the opsonic index of each patient, it was a treatment suitable for large hospitals and institutions with laboratory facilities only. Hartzell agreed with him, saying that the most that can be claimed for the treatment at present was that it is encouraging in its outlook. Heidingsfeld had had excellent results in a number of cases. Perhaps the conclusions that Alderson comes to about represent the present status of the therapeutic method in dermatology:

1. It has not been proved that opsonic therapy produces good results in acne, furunculosis, sycosis, lupus vulgaris, etc., any more expeditiously than the usual approved methods.

2. Most of the dermatological cases were "much improved;" relatively few were "entirely well." These results were obtained only after prolonged opsonic treatment.

3. So far none of these cases have been reported by a dermatologist (Varney's paper was not accessible at the time this was written), but have come from the records of surgeons and general practitioners who might easily misinterpret the clinical picture presented by certain skin diseases in their different phases.

4. Opsonic treatment is of undoubted assistance in certain chronic bacterial skin diseases. To produce the best results much auxiliary treatment is necessary.

The abstracter of this article, in the *New York State Journal of Medicine*, states that since the above article was published a number of trained dermatologists have reported on the opsonic treatment of various skin

[1] Journal of the American Medical Association, July 27, 1907.

[2] Journal of Cutaneous Diseases, July, 1907.

diseases, and their conclusions are practically the same as those of Alderson.

Ring-worm. The commonness of ring-worm of the head and the beard, and the recalcitrancy of the affection, makes the subject of perennial interest. Two years ago I gave a fairly detailed account of the status of the therapeutics of this affection, paying special attention to epilation by means of the *x*-ray first proposed by Sabouraud[1] and still in vogue in the Paris ring-worm school, the Ecole Lailler, where more cases are treated, I believe, than anywhere else in the world. The process is merely one of epilation; parasiticide remedies must be used as well. It is advocated by some of the latest authorities in Europe as Ehrmann,[2] but I confess that I have not used it myself. The arguments for and against the employment of the *x*-ray receive attention in this present review.[3] Personally I have seen only a few ring-worm cases that have been so treated, and I have been very unfavorably impressed with the results. They were, it is true, bad cases from Randall's Island and other institutions which had lasted for many years, and in which the entire scalp was affected. But the ring-worm was still present, and the *x*-ray burns, that all the patients suffered from in varying degree, spoke badly for the method. It may be that our technique here is defective, but I do not hesitate to state that I consider the use of the ray for epilation in ring-worm entirely unjustifiable in all ordinary cases. If used at all it is only after all other methods of epilation, forceps, epilating stick, etc., have been conscientiously tried.

Ring-worm from Cattle. Kessler[4] calls attention to the fact that whilst the domestic animals are universally accused of being the source of the disease, in the country districts, especially where stock raising is pursued, it is most often contracted from yearling calves. In older cattle the parasite rarely grows. It is quite common in some regions, the farmers calling it "barn itch." In some of the cases Kessler examined the cattle on the farm, and found the trichophyton in abundance in the scales. In the calves the disease appeared as whitish, circular crusts running along the nape of the neck, face, and nose. The crusts were piled up, one-quarter to one-half inch deep, and looked like broken asbestos. In the horse the picture was a very different one. The patches were round or oval, with loss of hair; the scales and crusts were grayish blue or mouse colored, and the skin had a mangy look similar to that of the dog and cat when affected with the same disease. The author states that the calves recover spontaneously when turned out to grass in the spring, but the infection remains on the boards, posts, and feeding racks of the cattle sheds, against which the itching animals had rubbed themselves, and a new lot of calves are infected in the fall. In

[1] Progressive Medicine, September, 1906, p. 126.

[2] Die Anwendung der Elektrizitat in der Dermatologie, Safar, Vienna, 1908, p. 114.

[3] Page 130. [4] Journal of the American Medical Association, October 25, 1908.

the last eighteen months he had been able to trace 16 cases of ring-worm to calves: 3 to a cat; a few only were untraceable. Ring-worm contracted from the lower animals, he finds, is very much more virulent than when gotten from human beings.

Further investigation of this source of the ring-worm contagion is very desirable, and it can best be done by the practitioner in the country who comes in contact with cattle raisers. We are apt to assume a human origin for our cases in the cities, and yet it may be well that the chief source of contagion, especially in the virulent and recalcitrant cases, may be in animals. In that case efforts to eradicate the disease and prevent its spread should be directed in the first place to the infected calves and horses.

Ring-worm of the Nails. Ravogli[1] calls attention to the probable greater commonness of ring-worm of the nails than is generally supposed. The presence of trichophytosis on other parts of the body would lead us

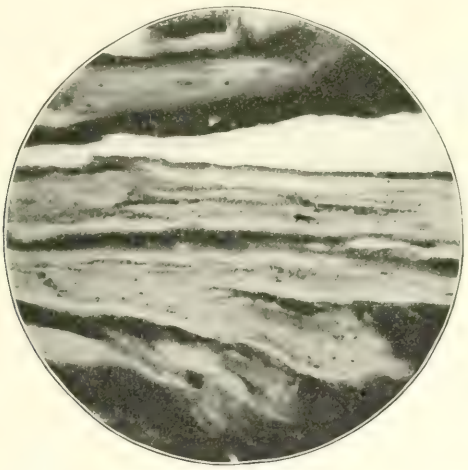


FIG. 25.—Ring-worm of the nail. (Ravogli's case.)

to suspect the trichopytosic nature of almost any coincident affection of the nails; but where these latter are affected alone the diagnosis may be very difficult. Though Zinsser has asserted that this does not occur, the cases of Gerson and Neuberger, where all the finger nails were finally affected without the appearence of ring-worm elsewhere, proves that there are such cases. The diagnosis, however, can only be made positively with the aid of the microscope, as is well shown in one of Ravogli's cases, where there was no ring-worm elsewhere on the body. All the nails of the fingers and toes were involved, the patient having suffered from the affection for over twenty years. In the oldest digits involved the nails were entirely lost; in the others they were affected in different degrees in

[1] Journal of the American Medical Association, July 27, 1907.

accordance with the length of time that the disease had been present. The nails were somewhat thick and opaque; their surfaces were rough and uneven and showed longitudinal folds. The nails kept breaking and splitting longitudinally, and pieces of nail were hanging on the nail bed. Where the nail had fallen or had been removed an irregular nail bed riddled with small holes was left behind. Portions of the nail were softened with liquor potassæ, and it was then apparent under the microscope that the fibers of the nail plate contained an abundance of trichophyton spores and mycelia. Culture on maltose-agar gave typical growths. The photomicrograph shows the fungus growing in the interstices of the nail plate, and the nail fibers are separated just as occurs in the hair. The ultimate result in these cases is destruction of the nail plate and atrophy of the bed. Infection is conveyed from one nail to another by the use of the same knife or scissors for trimming the healthy and the diseased nails.

Treatment of these cases is difficult from the fact that the fungus is deep-seated and well protected; and this explains also the fact that in some cases at all events the parasite may luxuriate in the nails for many years without being transplanted onto any other part of the body.

Removal of the affected nails is usually necessary before a cure can be affected. This is necessarily a severe treatment, and many patients refuse to submit it to. An ointment containing a large proportion of pyrogallic acid is put over the finger tip as an occlusive dressing, causing an artificial paronychia which results in shedding of the nail. Then mild parasiticides, as sulphur, suffice for cure. In one of Ravogli's cases, in which the scalp as well as the nails were affected, Wilkinson's ointment cured both sets of lesions without removal of the nails. This is, however, an unusual result so far as the nails are concerned, and the parasite must have been especially superficially located. The *x*-rays have been recommended for these mycoses, of course, and Pellizzari[1] records a case that was cured by nine ten-minute exposures. I have elsewhere expressed myself[2] as to the propriety of this treatment, and should not recommend its employment in ring-worm of the nails.

Tuberculosis of the Skin and the Tuberculin Test. Though not strictly affections of the skin, *tuberculoses of the mucosæ* of the natural orifices of the body are lesions about which the dermatologist is consulted, and with which he must be familiar. To those who would study the tuberculoses of the mouth I can recommend the article on that subject that has been recently published by Robert Levy.[3] The number of cases and of collections of cases recorded is now very large, and the article in question is a useful resume and abstract of them.

Tuberculous ulceration of the mouth mucosa appears in three forms: a nodule or tumor, an ulceration which may be quite superficial or may

[1] Lo Sperimentale, 1896, lx, 6.

[2] Page 130.

[3] The Laryngoscope, December, 1907.

be deep enough to involve the underlying bone, and as an abscess. It may be an endogenous infection, reaching the superficial tissues through the body fluids, or, as is probably more often the case, ectogenous and due to the implantation and growth of the bacilli on the surface. The former, as may be supposed, is the more active, rapid, and virulent form of the infection, whilst the latter results in the slower and less malignant forms of the local disease. Males are more commonly affected than females, probably on account of the greater liability of these former to lesions and irritations of the mucosa from tobacco, pipes, etc.

The subjective symptoms occasioned by these lesions are often, especially in their earlier stages, so slight as to escape the patient's notice; so that the lesions are rarely seen in their tuberous stage, but are already ulcerated when first detected. In general there is a superficial pale ulceration without inflammatory areola, and with irregular undermined edges. The secretion on this lesion is viscid and dirty white; and scattered irregularly on its surface and margin are small, soft, red granulations, interspersed with pinhead-sized spots of yellow and gray. These latter are the characteristic "spots of Trelat." These yellow spots break down, extend, and coalesce, and give rise to the peculiar worm-eaten appearance of the tuberculous ulceration.

The diagnosis of these lesions must be made largely on their appearance, helped possibly by the presence of demonstrably tuberculous lesions of the lungs and other organs. To detect the bacilli it is not sufficient to examine swabbings from the surface, since tubercle bacilli may be accidentally present in the mouth. The surface of the ulcer must be thoroughly cleansed and then well curetted under cocaine; and from the curettings thin smears may be made. Or a fragment may be excised, and the sections examined for the bacilli. The bacilli may be very infrequent, however, and I believe that guinea-pig inoculation is a much surer method of proof. Histological examination alone is of little value, since we have learned that neither giant cells nor caseation is proof positive of tuberculosis. The prognosis in all cases is bad. Though they progress very slowly, they rarely heal.

As regards the treatment, Levy recommends the application of cocaine or powdered orthoform to relieve the pain; curetting or cauterizing the base of the ulcer is also useful, probably because this distressing symptom is caused rather by the development of small neuromata on the nerve ends than by their mere exposure. The galvanocautery may be employed for their thorough destruction; though under that treatment or excision the ulceration reappears in the scar or in the neighboring tissue as a general thing. Rest, avoidance of irritation, nutrition, fresh air, in fact all the measures that we rely on in tuberculoses of other organs are of more importance than local measures.

MacGowan[1] goes very thoroughly into the entire subject of the treat-

[1] Journal of the American Medical Association, August 31, 1907

ment of the tuberculoses of the skin. Cod-liver oil he allows in young subjects with good digestions, but he evidently has no great belief in its efficacy. Arsenic is of value, but mercury, preferably in the form of the protiodide, is decidedly better even in the forms of the disease where there is no suspicion of co-existent syphilis. As regards the value of the tuberculin derivatives as therapeutic agents, MacGowan expresses himself skeptically; and I entirely agree with him. Local measures are of course of the greatest importance, and these are discussed under the following heads:

1. *Light Rays.* Phototherapy by the Finsen method is the treatment of election. The details of it, and the arguments in favor and against it have been fully discussed in these pages. Suffice it to say that its expense and tediousness preclude its employment by the general practitioner. The *x*-ray has also been abundantly discussed. In the hands of skilled operators, says MacGowan, it has accomplished wonders, but it is unsafe, often does much harm, and may fail to cure or even occasion the appearance of epithelioma.

2. *Bloody Methods.* Ablation, according to the method of Lang, has been successful where the lesion is so situated that the operation can be thoroughly done. Curetting, if thoroughly done under general or local anesthesia, and especially if followed up by the use of a 50 per cent. zinc chloride solution bored into the curetted surface by means of toothpicks covered with thin cotton swabs, is evidently the author's favorite method of treatment. I agree with him largely; but it is necessary that all parts of the operation be thoroughly done, and I must refer the reader to the article itself for the important details which are too long to repeat here. The galvanocautery, or the Paquelin, MacGowan does not favor, either as the sole curative agent or after curetting, on account of the keloidal scars that he finds so frequently after it.

3. *Elective Caustics.* The first one discussed is the salicylic acid-creosote plaster made by Biersdorf. This is applied daily for fourteen days, and excites a reactive inflammation that leads to the necrosis of the tuberculous foci. Every variety of lupus, ulcerated or not, can be treated by this method; and in the hands of those skilled in its use it sometimes gives excellent results. Silver nitrate may be used for small foci; and MacGowan especially favors the employment of a moulded cone of silver nitrate containing 10 per cent. of caustic potash, and dug into the nodules. Lactic acid in 10 per cent. solution is better for ulcerations of the mucous membranes than for the tuberculous ulcerations of the skin.

The tuberculin test in dermal tuberculoses has been the subject of a number of articles, of which those of Pospelow and of Selenew and Kudisch[1] may be taken as examples. The matter is of present interest since the test is being largely used, and might be of value in the large number of dermatological cases in which the diagnosis is a matter of

[1] Russische Zeitschrift f. Haut und venerische Krankheiten, November, 1907.

doubt. Pospelow's results were clean cut and decisive. He concludes his article as follows: "The tuberculin reaction in our five cases of skin tuberculosis was plain and marked, especially in the patients with tuberculous ulceration of the nose; in all the other non-tuberculous patients the tuberculin reaction was entirely absent." Selenew and Kudisch's conclusions, in so far as they interest us here, were as follows:

1. In the ophthalmic tuberculin reaction we have an absolutely sure, quick, and convenient method for the diagnosis of skin tuberculosis.

2. Positive results were obtained in lupus pernio, lupus vulgaris, prurigo, tuberculosis verrucosa cutis, lupus erythematosus, chronic eczema of the hands, pityriasis versicolor, and leprosy.

3. Negative results were gotten in syphilis and a lupus erythematosus with very slight infiltration.

At the present writing I cannot say that these conclusions have been confirmed. Certainly the inclusion in the positive column of such diseases as pityriasis versicolor, eczema, and leprosy would tend to vitiate the value of the test in the diagnosis of cutaneous tuberculosis. Lupus erythematosus also is by no means to be unhesitatingly placed in the tuberculous column; there are at present at least as many reasons against as for that conclusion. In some respects the tuberculin diagnostic test in dermatoses resembles that of finding the spirochete in supposedly syphilitic lesions. In the immense majority of cases it is not required, and in the doubtful ones it is not so readily applied or so decisive as to be of immediate value. Over and above this we have quite recently learned in New York that in its most readily applied form, the ocular test, it may be dangerous. Some eyes have been nearly lost through it at the City Hospital, and the rule has been laid down there, and I believe in some other institutions, that the test is only to be used in special cases and after the eyes to be instilled have been examined and passed upon by the ophthalmologist on service.

Urticaria. Murrell[1] gives some valuable hints as to the treatment of this common and troublesome affection. Three distinct forms of the disease occur. In urticaria factitia there is a general reflex irritability of the skin, so that it reacts in the form of wheals to any external irritant; and as the wheals follow the course of the irritant exactly, and letters and figures can be brought out in wheals when traced on the skin, it is often called dermographism. There are no spontaneous lesions. Urticaria acuta is the ordinary form usually appearing in wheals, but sometimes papular or vesicular, and commonly as a direct reflex from the gastro-intestinal canal. Urticaria chronica is an intractable and sometimes really incurable form of the affection; the lesions are rarely very extensive, but they recur, with intervals, indefinitely, and often resist the most strenuous efforts at cure. This is not Murrell's classification, but it is the one that I consider most practically useful.

[1] Virginia Medical Semi-monthly, June 22, 1906.

All urticarias are either reflex or toxic in origin. In the first form an irritant of some kind, usually in the gastro-intestinal canal, causes the dermal outbreak. A sedative is indicated first; dilute hydrocyanic acid is a favorite one. Then the bowels should be clear with a mild saline and a high enema employed to empty the lower gut. Later on the treatment for gastritis is indicated.

In the toxic form of the disease an emetic, followed by a mercury and saline purge, is indicated to remove the offending material. In the more chronic cases the ingenuity of the physician and the patience of the patient are usually severely taxed. A strict supervision of the patient's habits and mode of life, the stoppage of alcohol, tobacco, tea, coffee, etc.; laxatives or saline purgatives, at regular intervals, the use of a bland and even of a purely vegetable diet for a time—all these may be indicated. As regards drugs the only ones that I have found of any value are the intestinal antiseptics. Beta-naphthol, bismuth, salol, etc., may be given internally. Aspirin has also given good results in some cases.

As regards external applications we have a wide range. For the acuter forms I may mention 1 to 3 per cent. menthol, carbolic, or thymol spirit; 1 to 2 per cent. carbolic vaseline, or 2 per cent. bromocoll ointment. In the chronic forms nothing in the way of external applications has given me so much satisfaction as a 2 per cent. anesthesin ointment.

The X-ray in Dermatology: Its Uses, Dangers, and Abuses. I believe that the time has at last come when it is possible to make a general survey of the field covered by this agent in dermatotherapeutics, and to come to some conclusion as to its real efficacy. There can be no manner of doubt of its necessity. For years past the journals have been filled with articles extolling this agent as the remedy par excellence for dermatoses of all kinds, for the most trivial eczema and pruritus on the one hand to the most serious carcinoma and mycosis fungoides on the other. A discordant note, however, is becoming more and more manifest in the chorus of praise, and it is being emphasized from the non-medical region of the Law Courts, in the shape of increasingly frequent suits for damage done to the patient by the ray. What the general practitioner wants to know is this: Is the *x*-ray really a reliable agent for the cure of dermatoses, and if it is, in what diseases is it proper to use it? Is it safe to employ it, and can it be used by anyone in ordinary daily work?

I have endeavored to answer these questions in a paper read in the Section of Cutaneous Medicine at the last meeting of the American Medical Association.[1] It may seem strange that after years of use and experimentation they have not long been settled. Yet such is undoubtedly the case. In some of the most recent articles upon the subject, as for instance in that of Stern,[2] the ray is lauded as a remedy for such

[1] Journal of American Medical Association, 1908.

[2] Journal of Cutaneous Diseases, September, 1908.

affections as eczema, psoriasis, acne, and pruritus. As against this there are men, including to my personal knowledge some whose opportunities for observation and judgment in this matter have been unrivalled, who absolutely deny any real therapeutic efficacy to it. The judicious observer in such cases very properly concludes that the truth probably lies between the two extremes. It is not possible that all the many writers who have recorded good results in dermatoses from the rays have been mistaken. Nor is it probable that in this single mechanico-therapeutic measure we have a remedy that replaces and renders valueless all other remedial agents.

I have given a good deal of thought and study to this subject, and if I dwell upon it at some length this is justified by its importance. For the ray seems to possess a peculiar fascination for the practitioner. The mere possession of an apparatus for its production seems to be a reason for its employment, and this is true not only of some dermatologists but also of others who lay no claim to that special title. An obstinate dermatosis of any kind, or even an undiagnosticated skin affection, is to many, I am afraid, an indication for the use of the *x*-rays. It will be convenient to subdivide the subject as follows:

1. Is the *x*-ray definitely established as a dermatotherapeutic agent? This question can be answered in the affirmative, in spite of the opinions of its uselessness above referred to. It is, however, strictly limited in its field. There are very few affections in which no other method of treatment at present known is efficacious, and there are occasional instances of other usually more tractable affections that resist ordinary methods. And if it be denied, as it may be, that even in these cases a cure cannot be effected by the ray, the evidence is indubitable that a considerable improvement and amelioration of symptoms can be gotten from its use.

2. Is the *x*-rays a safe method of treatment for the general practitioner to use? Undoubtedly it is not. To use the *x*-ray for other than its so-called "psychic" effect, a practice that I am sorry to see much in vogue at present, to get definite therapeutic effects it is often necessary to push the treatment to a point where the getting or non-getting of an undesirable amount of reaction is purely a matter of accident. For it must be admitted that we are entirely without reliable means of measuring the dosage of the ray. Geyser, in a recent elaborate review of all the methods proposed for that purpose, admits as much. Nor can we ascertain, save by actual experiment and reaction, the value of the other factor in determining results, the idiosyncrasy of the patient.

Another point that deserves consideration under this heading is the attitude of the public and the courts to *x*-ray accidents. The former is undoubtedly awake to the fact that the doctor may be held responsible. It is true that in New York County only eleven *x*-ray damage suits have been tried, and that all these have so far resulted in a verdict for the

defendant. Another one is being tried at this writing, and I know of a number of others that are on the calender, or are going to be brought. Though I have luckily had none myself, I have been concerned in a number of these suits as expert, always, of course, on the side of the physician. And I realize the truth of the assertion made by Mr. James Taylor Lewis, counsel for the New York County Medical Association, in a recent radiotherapeutic discussion, to the effect that there was evidence of a change of attitude on the part of the court in these suits. The burden of proof was formerly entirely upon the plaintiff, who had to prove damages, want of skill, etc. In future cases the burden of proof would in all probability be placed largely upon the defendant, who would be called upon to explain how it was that he employed an unmeasurable, more or less unknown, and possible dangerous remedy for a disease that admitted of other safe and well-recognized treatment.

I shall not here go into the question of the possible ill-results of the *x*-ray treatment. Possibly I have seen more than my share of them; for years past I have always had one or more of them under my care. But the fact must be admitted that in a certain number of cases and under circumstances that we have no means of foretelling, sclerotization, telangiectases, inflammation and ulceration of the most intractable nature, carcinoma, and affections of the bones and internal organs, and even eventual loss of life, does occur. The conclusion is justified that when the *x*-ray must be used it should be employed only by experts; by practitioners whose familiarity with *x*-ray methods, effects, and results has been such as to justify the assumption that the greatest possible amount of skill has been displayed, and that every possible precaution prescribed by the latest technique has been employed.

3. In what dermatoses is it legitimate to use the *x*-ray? On this subject my opinions are very decided. Radiotherapy is to be used only in cases for which there is no other effective treatment. This excludes from the list at once all the varied commoner skin diseases with which the tables of "results" of the ray enthusiasts are filled. It is absolutely improper to treat affections like pruritus, eczema, psoriasis, acne rosacea, hypertrichosis, molluscum, ring-worm, favus, etc., with it. For all these we possess other efficacious and perfectly safe methods of treatment. Further, as the radiologists admit and common experience confirms, all the deeper forms of cancer of the skin are entirely recalcitrant to the rays, and the superficial forms can be radically cured in various ways, amongst which I need only mention caustics and the knife, these affections are not to be treated with this remedy. Lupus vulgaris and the different tuberculoses of the skin fall under the same category. It is doubtful if they are ever radically cured by the ray; and we certainly possess in the light treatment, excision and transplantation, destruction by cautery, just as efficacious and far safer remedies. Lupus erythematosus is acknowledged to be recalcitrant to the rays.

What then remains in the dermatological field of radiotherapeutic activity? Only a very few affections, which either from their essential recalcitrancy to treatment or from the circumstances inherent in individual cases, leave us no other method of treatment. The use of the *x*-ray is justifiable only in the following dermatoses:

(*a*) *Cancers*, superficial or deep, which are so situated, as on the eyelids or at the nares, that extensive destruction of tissue must be avoided; or such as have relapsed more than once under other treatment; or, finally, such as are so extensive that no other treatment is applicable. I am firmly convinced, indeed, that a radical cure of cancer, even in its most superficial forms in the skin, cannot be secured in this way. My own experience agrees with that of most other dermatologists to the effect that whilst amelioration of the carcinomatous process can be obtained, ulcerations be made to heal over, and infiltrations caused to disappear, the cancer remains and sooner or later breaks out again. With each succeeding relapse the effect of the *x*-ray is less and less markedly good, until, finally, its beneficial action ceases altogether. We can, however, secure a relative or temporary cure, and we can get amelioration, lessening in size, diminution of pain and discharge in more advanced cases. All epitheliomas and rodent ulcers, however, that can be treated with arsenic, caustic potash, the knife, etc., must not be subjected to the *x*-rays.

(*b*) *Lupus Vulgaris and other Dermal Tuberculoses.* Here the treatment of election is in most cases the Finsen light, unfortunately rarely obtainable here. Smaller foci should be excised; in larger ones the various destructive agents may be applied to the tuberculous granulomata, pure carbolic acid, potassa fusa, the burr, or the actual cautery. There remain some cases, however, in which either for personal reasons, or on account of the extent of the disease, in which the *x*-ray can be used. I have never seen a case of lupus of the face permanently cured by the *x*-ray, and I regard the method as an adjuvant and symptomatic remedy only for the disease.

(*c*) *Keloid.* Here in most cases the best treatment is to persuade the patient to let the tumors alone. If something has to be done, the ray is the only treatment that offers hope of success. It is not certain; but it is certain that neither excision nor cross-hatching, followed by a mercurial ointment, nor any of the older methods offer hope of success. I include under this heading the acne keloid of the nape.

(*d*) A very few of the most extensive and recalcitrant cases of *fungous disease* of the hairy parts, ring-worm, favus, and parasitic sycosis, may be treated with the *x*-ray. There is no parasiticide action; other remedies must be used after the epilation, effected by the treatment, appears. Epilation, however, is not always necessary, and can generally be effected with the forceps. I have long been in the habit of having epilation in bad cases of ring-worm of the beard done completely under ether narcosis at one session. In exceptional cases, however, the *x*-ray may be preferred.

(*e*) *Mycosis, Fungoides, Sarcoma Cutis, etc.* In these very rare and really hopeless affections some good results have been reported from the use of the *x*-ray, temporary and local, of course, but desirable in that the patient's condition was for the time being improved. I believe that the remedy may be properly used in these cases.

(*f*) *Rhinoscleroma.* Therapeusis other than that of the *x*-ray has done nothing in this disease, and I and others have seen very great improvement in the local condition under its use.

Here ends the brief list, which includes only exceptional cases of two or three of the commoner dermatoses and a few very rare skin diseases. It is possible that further experience may still further reduce it; it is very improbable that it will be extended. It is a program very different from that of the enthusiasts for the method, but even these latter have in recent times been continuously modifying and restricting their claims. My object in going into the matter in such detail is to sound a plain note of warning. The stand that I take will be indorsed, I think, by most conservative dermatologists. The *x*-ray is an uncertain remedy that may have very deleterious effects; it may be dangerous for the doctor as well as for the patient; it should be employed only by experts, and its use should be reserved for cases that are entirely unamenable to other treatment.

SYPHILIS.

Atoxyl. Atoxyl, the aniline-arsenate of sodium, has been highly praised in certain quarters during the past year as a remedy for syphilis. In Paris the lay press has even taken it up; so that as a medical editor says, it is, metaphorically speaking, in every mouth if not yet under every skin. It has also been used for acne, psoriasis, and other common dermal affections, as well as in a large variety of internal diseases. In fact the wide range of applicability that is claimed for it, and the variety of diseases that it is reported to have cured are in themselves sufficient to excite suspicion in the mind of the cautious observer, and in point of fact the more recent and authoritative articles concerning it have been devoted largely to warnings of its danger.

Atoxyl, according to the report from the Chemical Laboratory of the American Medical Association,[1] is a meta-arsenic anilide, said to contain 36.69 per cent. of arsenic. The analysis showed that it contained very much less, some 25.77 per cent. The metal also is in the form of an arsenate, whilst in Fowler's solution, with which it was compared, it is an arsenite; and exact estimation of the metal in the recommended dose showed that it was but one and one-half times that of the usual dose of Fowler's solution. Yet it is claimed that forty times more arsenic can be given in this than in the older forms of the drug.

[1] Journal of the American Medical Association, September 21, 1907,

We are interested here only with its reputed action in syphilis, which in some enthusiastic quarters is believed to be such as to enable it to replace mercury almost entirely. Neisser writes from Batavia[1] that his experimental researches on apes show an unmistakable action in that disease. Inoculated animals do not develop disease when treated with atoxyl. Some good results have been reported from its employment in the human subject, especially in recalcitrant cases, or in those in which mercury cannot be employed.

On the other hand reports of bad effects and warnings as to dangers from the drug are multiplying. Hallopeau[2] reports a case of a woman who received 5.1 grams of atoxyl in twenty-six days by hypodermic injection. She began to suffer from disorders of vision, which culminated in complete amaurosis in fourteen days. The ophthalmoscope showed only a slight localized choroiditis. Of course in this case the alcoholic history and the possibility of there having been impurities in the drug, as has been found by Duret, had to be considered. But there have been other instances of amaurosis from its use. Ayres Kopke reported some at the recent conference in London on the sleeping sickness. Brenning[3] reported two cases in which the injections were followed by symptoms of intoxication, headache, somnolence, vertigo, fever, vomiting, etc., and two days later retention of urine. The author is inclined to attribute the unfavorable symptoms rather to the aniline than to the arsenic. Levy-Bing has had similar experiences.

I would quite agree with the conclusions of Doven in his review of Brenning's article. Atoxyl is a powerful drug, about which we as yet know little, and that little is not quite in accord with the claims made for it in the literature published by its manufacturers. If used at all it should be reserved for serious lesions that cannot be effectively treated by the ordinry remedies. In any case the dose should not exceed 20 cm. ($3\frac{1}{3}$ gr.) twice weekly.

Eye Syphilis. This subject is considered in detail by Brunson.[4] Starting with the lids the author calls attention to the relative frequency of gummatous lesions which are liable to be confounded with ordinary dacryocystitis. Chancre of the conjunctiva is rare, as is gumma; that membrane being affected most often secondarily to syphilitic inflammation of the iris and the ciliary body. The lacrymal sac is frequently affected through the nose, acute and chronic syphilitic rhinitis extending into it. In the cornea the majority at all events of the interstitial keratites are syphilitic, and usually of the hereditary variety. The iris and ciliary body are common seats of secondary and tertiary lues; at least 70 per

[1] Deutsche Medizinische Wochenschrift, September 19, 1907.
[2] Bulletin de l'Académie de Médecine de Paris, December, 1907.
[3] Annales de Dermatologie, October, 1907.
[4] Journal of the American Medical Association, April 6, 1907.

cent. of all irites are caused by this infection. Cyclitis, scleritis, and chorioretinitis are also on the list of syphilitic eye affections.

Frank Judson Parker discusses a portion of the same subject in his article read before the New York Medical Society[1] in connection with two interesting cases, pictures of which are reproduced here. The first was a case of gummatous infiltration of the lid (Fig. 26) in a male adult who denied ever having had syphilis. Microscopic examination of the diseased tissue suggested syphilis, which by the eye is the utmost that examination can tell us as regards the diagnosis of lues. Healing was rapid under appropriate, internal treatment. The other case was also



Fig. 26.—Gummatous infiltration of the lid. (Parker's case.)

a male adult on whose right upper eyelid a small sore had appeared some three days before. The point of infection was the edge of the lid, and the entire tarsal cartilage was swollen and very hard. There was in addition an adenopathy and a specific roseola.

Syphilis of the eye was last noted in Progressive Medicine in 1902, p. 209, in connection with an interesting case of gumma of the ciliary body recorded and pictured by Stieren.

[1] New York State Journal of Medicine, July, 1907.

Excision of the Chancre. In a previous review I briefly referred to this subject[1] on which I have long held views not quite in accord, I am afraid, with what is generally taught on the subject. During the past year there have appeared several elaborate articles about it, some of which have been decidedly favorable. Of course I entirely exclude, as unsuitable per se for the operation, all cases in which the initial sclerosis is on the glans, or where, if extragenital, it is on the fingers, etc., the result being entirely problematical as I am ready to admit; no excision should be done where any considerable mutilation is involved in the operation.

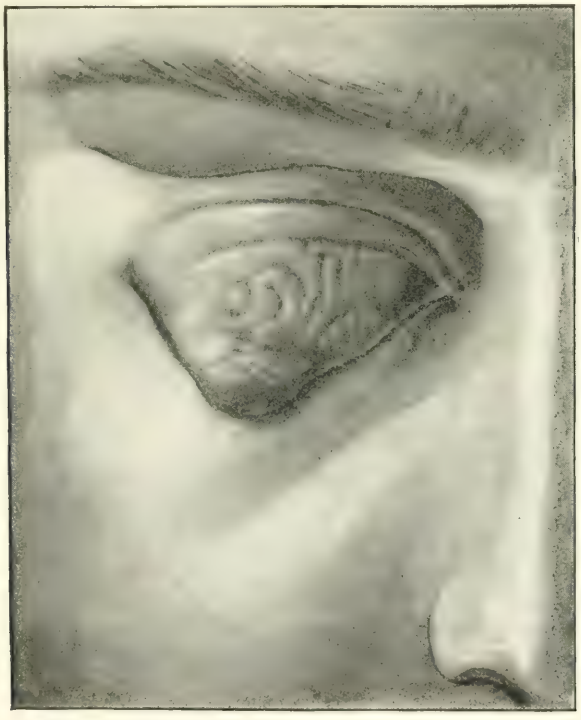


Fig. 27.—Chancre of upper lid. (Parker's case.)

Witte[2] records three cases of chancre excision practised eight, fourteen, and fifteen days after the appearance of the infection, and with success in the sense that three to seven months later there had been no symptoms of general infection. In none of the cases was there any adenopathy. In all three cases the histological examination appeared to confirm the diagnosis.

Lukasiewicz[3] distinctly recommends excision when the lesion is seen

[1] Progressive Medicine, September, 1907, p. 131.

[2] Archiv f. Dermatologie und Syphilis, lxxxv, p. 274.

[3] Polnische Zeitschrift f. Dermatologie und Venerologie, 1907, Nrs. 7 und 9.

before any other symptoms develop, it being now possible to make a positive diagnosis from finding the spirochete before these occur.

Jadassohn[1] is more or less conservative in the expression of his opinion, but he is inclined to favor excision and believes that it should be far more extensively employed than is the case.

These opinions are interesting in view of the fact that the profession has apparently accepted the opinion of Ricord[2] that the destruction of the chancre is absolutely useless no matter how early it is done. Taylor[3] has been one of the most emphatic advocates of this doctrine in this country, going so far as to say that even if the entire penis should be amputated before the chancre shows itself, syphilis would nevertheless follow inoculation. A statement of this kind, of course, is too dogmatic to be strictly true. It certainly takes an appreciable interval of time for the spirochete to travel from the site of inoculation. This time may be found to be so short that most excisions can only be made too late to prevent general infection, but it is hardly conceivable that during the weeks of primary incubation, when the patient is locally and generally in perfect health, the spirochete can be vegetating in the tissue fluids. And, possibly, the same holds true for the secondary incubation, after the chancre has appeared; the patient, but for his sclerosis, feeling perfectly well until the outbreak of secondary symptoms occurs. Removal of a readily ablatable lesion at any time before the latter event occurs can do harm, and may do much good. Even if systemic infection is not prevented, as apparently was done in Witte's cases, the removal of a large infective focus can only do good. Personally, I can only point to one case in which I have succeeded, most of the instances in which I have done ablation being fairly well advanced after the infection. I have removed one typical chancre and have not seen any secondary infection in eleven months' subsequent observation. I have the ablated material in my laboratory now, and the sections of it show as typical sclerosis as any that I have seen. On the other hand, though I cannot say that the course of the disease in the other ablated cases was any different or any milder than ordinary, I have never had any reason to be sorry for having done it. I have always explained to the patient the small chance there was of preventing the disease, and the patients have always been willing to take that chance at the cost of a painless (local beta-eucaine anesthesia) and comparatively trivial operation.

Heredosyphilis. Bab[4] has made an exhaustive study of congenital syphilis in the light of the newer discoveries as to the etiology of the infection. He found the spirochete in practically all the tissues, and the 33 infants examined only 16 were born alive, and but 7 lived for more

[1] Archiv f. Dermatologie und Syphilis, June 19, 1907, p. 746.
[2] Annales de Dermatologie et de Syphiligraphie, 1881, p. 96.
[3] Medical Record, July 4, 1891.
[4] Zeitschrift f. Geb. und Gynäkologie, vol. lx, Nr. 2.

than a few days. The microörganisms were found in the lungs in 87.5 per cent., in the pancreas in 80 per cent., in the nose, skin, and eyes in 66.7 per cent. to 25 per cent. of the cases; the placenta was always found free. The examination of the milk of 4 syphilitic mothers revealed the presence therein of antibodies in large amounts; evidently the children would benefit immensely by being fed with it. In one case the spirochetes were found in the child of a healthy mother whose husband had contracted syphilis eighteen years before. Bab believes that the placenta allows the passage of spirochetes, but does not retain them.



FIG. 28.—Hutchinsonian teeth.

Gierke[1] has come to practically the same conclusions, demonstrating the spirochete in every case of congenital lues in one or more of the organs. On the other hand his numerous control experiments were all negative; the organism was never found in non-syphilitic infants.

Other articles on the spirochete in heredosyphilis have been published by Danziger,[2] Levaditi,[3] Beitzke,[4] Huebschmann,[5] Simmonds,[6] Babes and Mironescu,[7] etc. Like the other observers these writers have found

[1] Archiv f. Dermatologie, vol. lxxxi, p. 469.
[2] Monatshefte f. praktische Dermatologie, 1907, p. 208
[3] Ibid.
[4] Berliner klinische Wochenschrift, 1906, Nr. 24.
[5] Ibid.
[6] Münchener med. Wochenschrift, 1906, Nr. 27.
[7] Ibid., Nr. 24.

the microörganism in all the tissues, and in amount in direct proportion to the gross and histological changes in them. In fact Simmonds holds that the demonstration of the spirochete is quite sufficient for the diagnosis in any case where there is the least doubt. Only in macerated feti and in the most decomposed organs were they missed.

Ludwig Weiss[1] publishes an elaborate article on *syphilis in children*, in which the entire subject is presented very fully. Of special interest are his conclusions as regards the more unusual manifestations of the hereditary disease. The nervous system is involved in 13 per cent. of the cases, choreic symptoms being present in many cases. Epilepsy is also believed to result from the infection. Progressive paralysis is one of the most frequent nerve results. Locomotor ataxia is also ascribed to the hereditary infection in a number of cases.

The Iodides and Their Substitutes. The true medicinal antidote to the syphilitic virus is mercury, and mercury alone; and this is true of all stages of the disease from the earliest initial lesion to the latest tertiary manifestation. No greater therapeutic mistake can be made than to neglect the mercurial medication, no matter what the stage of the infection, so long as the symptoms of actual intoxication with the virus are present. There comes a time, however, in many cases in which the patient is suffering not so much from the actual growth of the spirochete in the tissues or the poisoning with its products, as from the presence of the remains or effects of the intoxication. Here mercury is still in order, but in addition to the mercury iodine in appropriate doses must be administered. And appropriate doses means amounts that will produce the desired effect, and not any definite quantity. In the systematic treatment of the disease, and in the absence of any special symptoms calling for intensive iodic medication, it is customary and proper to give iodine in moderate doses with the mercury when the disease has reached a stage at which the advent of the so-called tertiary manifestations may be expected. When the special symptoms above referred to do exist, the iodide must be pushed. I not uncommonly adminster 500 to 600 gr. of an iodide daily, and have had to give 1200 gr. before the desired effect was obtained.

Unfortunately iodine in the larger doses, and where an idiosyncrasy for the drug exists, even in very small amounts, causes certain disturbances of the gastro-intestinal tract and the general system that may be so intense as to necessitate abandoning its employment. The search for an iodine preparation that shall be free from this objection, or for some remedy that will counteract its deleterious effects, has been unremitting. I cannot say at this writing that it has been very successful, for the efficacy of the iodine preparations depends on the amount of the iodide that they contain, and their therapeutic is so bound up with

[1] New York State Journal of Medicine, November, 1907.

their general physiological effect that the one can hardly be secured without the other. There are several methods of administration of the older iodides, and several new iodine preparations for which advantages have been claimed, and these I propose to briefly review in these pages.

The *symptoms of iodism* are the catarrhal rhinitis, frontal headache, conjunctivitis, reddening of the face, edema of the pharynx and larynx, the acne, the tuberous iodide exanthem, etc. Often a mere persistence in and pushing of the medication will cause them to pass off, tolerance being rapidly established in some cases. In other cases putting the patient to bed with a mustard plaster or an ice-bag on his stomach will enable the larger doses to be borne. Advantage can be taken of the rectal method of administration, and the iodide solution mixed with milk can be injected in whole or in part by the usual nutritive enema method. A small dose of the fluidextract of ergot (5 to 10 drops) administered with the iodide in some cases greatly helps the system to bear it.

The commonest iodine preparation, the iodide of potash, is very liable to disagree, and is also a marked cardiac depressant. It contains 76.5 per cent. of iodine. Sodium iodide contains 84.6 per cent. of iodine, is milder, does not depress the heart, and is usually better borne. The iodide of ammonium has 87 per cent. and that of lithium 85.5 per cent. of iodine; any of these may be substituted for the ordinary potassium salt. Rubidium iodide is usually well borne, but it is a very expensive salt, so that its employment in larger doses is impracticable in ordinary cases. All these drugs are best administered in large quantities of water or milk after meals. I have employed the tincture of iodine in doses of 10 drops to begin with, and well diluted, in a large number of cases.

A number of organic iodine preparations have been recently introduced, the object being to get an iodine preparation that will give the specific drug effect without the iodism. Iodalb acid, dosage 10 to 20 gr. t. d., is one that has been largely used. The eigon preparations are peptonates of iodine that agree well with the stomach, and I have given them in large doses; unfortunately they are not always readily obtainable in this country. Sajodin has been highly praised by Joseph,[1] as also has iothion; both these are said to be non-irritant to the gastro-intestinal tract, and all the combinations mentioned in this paragraph have the advantage of being administrable in the solid form. Iodine vasogen is specially recommended for children by Friedländer, 5 to 10 drops in milk, tea, or coffee three times daily; adults can take up to 30 drops at a dose.

The preparation of iodypin gives us a novelty in the shape of an iodine preparation that can be administered subcutaneously as well as by the mouth. Winternitz, Fischl, Neisser, Klingmüller, and many others

[1] Dermatologisches Centralblatt, October, 1907.

recommend it highly. Doses containing as much as 3 gr. of iodine are well borne. Internally the 10 per cent. preparation is administered in tea- to tablespoonful doses. Hypodermically (not intramuscularly) the 10 and the 25 per cent. solutions are employed up to 2 c.c., having been administered daily for long periods. It is especially suited for patients who for any reason cannot take iodine in the ordinary forms; a few injections are said to place the patient for weeks and even for months under the influence of the iodide medication. Jessner[1] speaks very well of this method of administering the drug; all that the patient experiences being a slight feeling of tension at the site of the infection, and all the unpleasant iodine effects being absent.

Syphilis in the Negro. Fox[2] calls attention to the prevalence of syphilis in the negro, a fact that is agreed on by almost all of those who have investigated the subject. His tables show a relative proportion of 27 per cent. in blacks as against 12 per cent. in whites of syphilis in all the cases. As

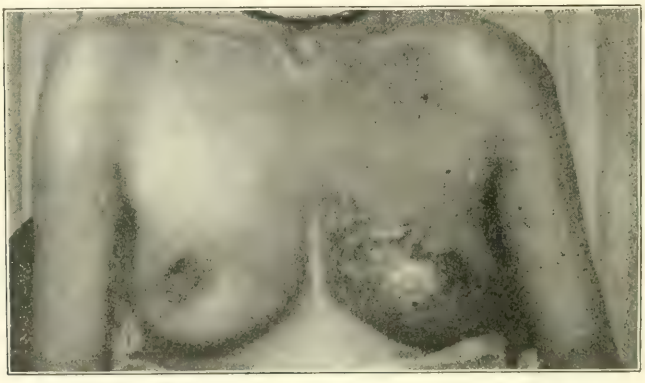


FIG. 29.—Chancre of each nipple. (Author's case.)

regards the relative severity of the disease in the two races, the author's conclusions, based partly upon statistics collected by himself and information derived from dermatologists who see large numbers of negro patients, are to the effect that on the whole it is less severe. The chancrous induration is prone to be larger and more persistent, the general adenopathy is more marked, and there is a notable greater tendency to the pustular forms of the general eruptions. Attention is called to the annular or circinate syphiloderm, which I agree with the writer in considering as an extremely common and very characteristic manifestation of the disease in the negro (Fig. 30).

The Spirochete. What we are justified today, I think, in calling the microörganic cause of syphilis has naturally largely occupied the attention of syphilographers and the medical public generally during the

[1] Kompendium der Hautkrankheiten, 1906.

[2] Journal of Cutaneous Diseases, February, 1908.

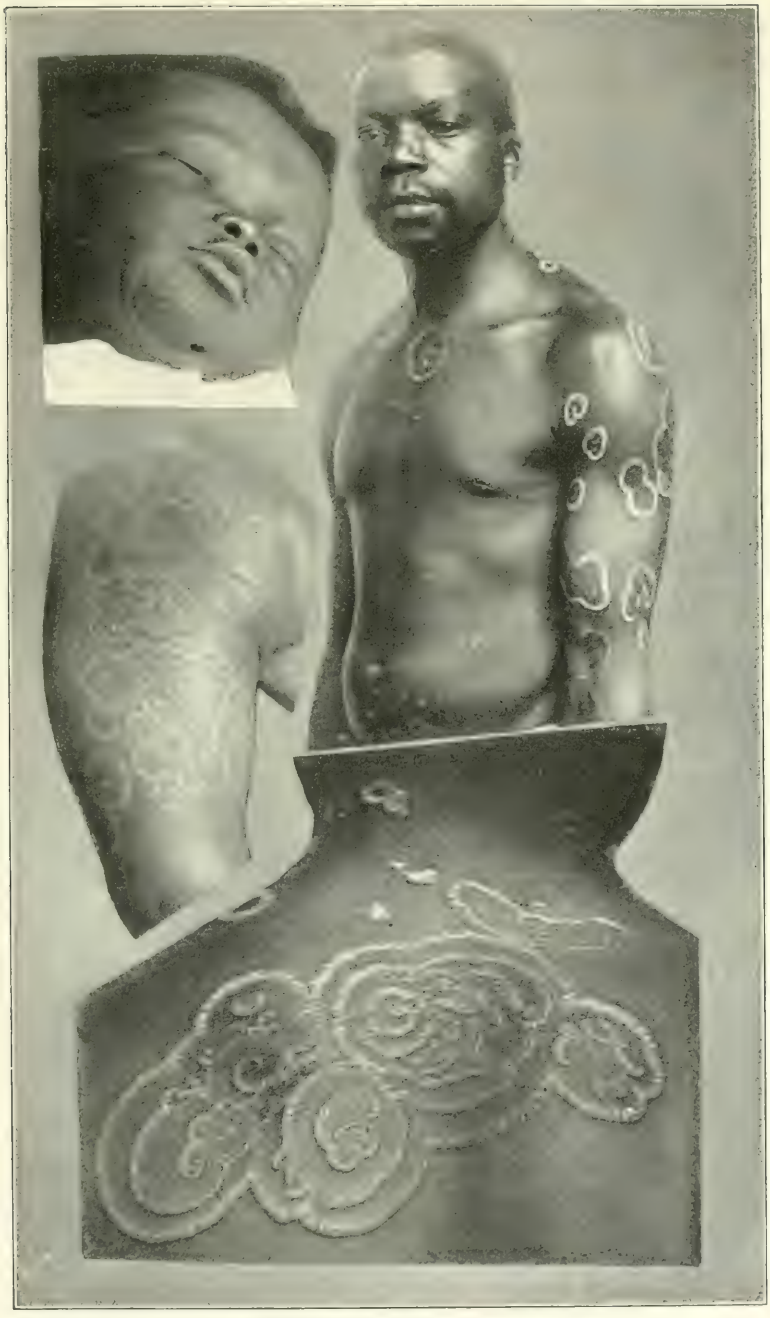


Fig. 30.—Circinate syphiloderm in a negro. (Howard Fox's case.)

past year. In last year's review I discussed in some detail the diagnostic value of the discovery, the different lesions in which it had been found, and the best and readiest[1] methods of staining it. These latter, though still useful, are no longer absolutely necessary. With the new black background illumination apparatus, which is now supplied by all the leading microscope makers, the spirochete can be demonstrated clinically from the fresh scrapings and in a very short time.

Among the multitude of articles on the subject that have appeared during the year I shall select two as embodying in completest form the results of the spirochete investigation. I refer to those of Ewing[2] and of Schultze.[3] The organism is uniformly present in the primary and in the early secondary lesions, as well as in those of congenital syphilis. It has been found often enough in the later manifestations to justify the statement that it is associated with every possible undeniable syphilitic lesion. The only lesions in which it has regularly not been found are the gummata, and these are really non-syphilitic from an actively infective point of view. More than this there is apparently a direct relationship between the number of spirochete and the severity of the infection. In the bad cases of congenital lues, where the child dies a few days after birth, in the large scleroses, and in the violent cutaneous and mucous membrane outbreaks of the early secondary disease, the tissues are found fairly flooded with them. In the late secondary lesions and the affections of the internal organs they are found more sparsely, and require diligent search for their detection. Finally in the gummatous lesions they are found at times, and at others careful examination fails to reveal them. All these facts are directly in accord with our clinical observations on the course and virulence of these various manifestations of the syphilitic infection.

Schultze's summary may be taken to represent the present state of our knowledge as regards the microörganism of syphilis; it is as follows:

The presence of the spirochete pallida, a characteristic spiral organism, in all the various manifestations of syphilis, has been confirmed by the vast majority of observers.

The negative results reported, comparatively few, demonstrate, if anything, only the difficulty of finding and identifying the organism.

The parasite is probably protozoan in nature.

The finding of the spirochete pallida in a doubtful case is of the greatest diagnostic value to the clinician.

Pure cultures have not yet been grown, therefore Koch's postulates cannot be complied with. But the constant presence of the parasite in the lesions of syphilis, its absence in other diseases, its definite relationship to the pathological changes, its morphological characteristics,

[1] Progressive Medicine, September, 1907, p. 122.

[2] New York State Journal of Medicine, May, 1907.

[3] Journal of Cutaneous Diseases, October, 1907.

and its presence in the lesions of experimental syphilis of the lower animals, furnish sufficient evidence to establish the etiological relationship of the spirochete pallida to syphilis.

Syphilophobia and Syphilomania. This is an important and practical subject, although, as Audry[1] in his masterly essay on the subject says, the most voluminous works on syphilis devote but a few lines at the most to it. Yet these are very real affections, although there may be some dispute as to whether they fall in the domain of the alienist or that of the syphilographer. We meet with instances of them every day, and this very winter past has seen the publication of a novel, for various best not specified reasons one of the most popular of the day, in which the suicide of a venereally infected youth is not only justified, but the possibility of the contagion is made the text of a sexual preachment and lesson at variance with all conventional morality.

Both syphilophobia and syphilomania are true obsessions; the main features in the one case being the persistent and unreasonable fear of contracting the disease, and in the other the irrational conviction that the affection is present.

Audry considers these affections as true diseases which may occur in healthy subjects or in those really infected with the disease. They occur most often in neurasthenics, but they may appear in individuals apparently quite normal and healthy. In either case treatment must be directed to the patient's mental condition. In some cases I have found it necessary to apparently acquiesce with the patient in his ideas, and to pretend to treat the patient for the syphilis that he did not have; and I am glad to say that in these cases I have always eventually succeeded in convincing the patient that he was cured. This was the course that Diday pursued; but Audry claims that specific treatment should never be employed in these cases. He counsels the most minute regulation of the patient's life, of absolute fixation of the hours of rising, going to bed, of rest, and of amusements, allowing no single moment of the day to remain unoccupied; careful attention to the food, and regulation of the gastro-intestinal tract; and he relies greatly on hydrotherapy as an aid. In some cases he has had a happy result by substituting some absorbing occupation, such as that of collecting in one form or another, or in women a religious occupation of some kind, for the syphilitic obsession. Travelling alone is bad, as is remaining in bed; the sea has a harmful effect. Mountain air, relative isolation, with the intelligent assistance of a friend, these, together with the insistent, authoritative, and persistent word of the physician, are the best means at our command to combat these distressing obsessions and help these unfortunate patients.

[1] Annales de Dermatologie, March, 1908.

OBSTETRICS.

By EDWARD P. DAVIS, M.D.

PREGNANCY.

A New Symptom of Pregnancy. Hertzl[1] calls attention to a sign of pregnancy reported by Halban, and which his observation has confirmed. This consists in the *hypertrichosis of pregnancy*. It shows itself not only in an abundant growth in the regions of the body ordinarily covered with hair, but also by the development of lanugo hair over the remainder of the body. This is supposed to result from the direct action of the placental substances, as there is reason to believe that these substances when administered to animals which are not pregnant stimulate the growth of hair.

In diagnosticating the condition of the fetus during pregnancy Schwab[2] has found that heart sounds are more readily obtained when the uterus is pressed down with the hand above the pubis, thus fixing the fundus and bringing the body of the child anteriorly beneath the stethoscope. Care must be taken that this manipulation be gently performed to avoid the possibility of danger of hemorrhage.

In attempting to diagnosticate the *sex of the fetus*, Schill[3] found that in 56 per cent. of cases of pregnant and parturient patients heart sounds no higher in rate than 141 indicated a male fetus, while those above 147 indicated a female child. These observations were more accurate in primigravidæ, where they gave a good result in 90 per cent., and in all pregnant patients they proved reliable in 73 per cent.

Changes in the Various Organs of the Body Produced by Pregnancy. Hofbauer[4] calls attention to the importance which recent study has demonstrated in the effects produced by disordered internal secretions in certain conditions arising in obstetrical and gynecological cases. In order to understand this, we may study with advantage the changes produced in the healthy organism by pregnancy, and thus the better comprehend the altered conditions in pathological pregnancy produced by a derangement through excess or deficiency of the internal secretions.

Hofbauer raises the question as to whether eclampsia may not be the

[1] Wiener klinische Wochenschrift, No. 7.

[2] Centralblatt f. Gynäkologie, No. 22, p. 628.

[3] Dublin Journal of Medical Sciences, January.

[4] Monatsschrift f. Geburtshülfe und Gynäkologie, Band xxv, Heft 5, 1907.

result of an excess in substances normally produced during a healthy pregnancy. If, for example, we understood perfectly the part played by the liver in the physiology of pregnancy, we should the better understand the cause and essential phenomenon of eclampsia in which the liver is evidently greatly at fault. Knowledge must be obtained in these cases by both histological and chemical investigation.

In making these studies Hofbauer utilized the case of a healthy multipara who died during labor from shock accompanied by severe lacerations of the cervix uteri. He also studied the case of a multiparous woman who a few days before the termination of pregnancy committed suicide by drinking carbolic acid. Death followed so rapidly that the various organs of the body were not greatly altered by the poison.

Especial attention was paid to the condition of the liver and kidneys. In studying the liver histologically, the central portion of the acinus, the cells in the zone, and the central vein were seen to be crowded with droplets or nuclei of fat of greater or smaller size. This infiltration rapidly diminished toward the periphery. A similar condition was observed in the liver of a pregnant mouse apparently in good health.

An extract of the human liver from a patient in the pregnant condition was made by chloroform, alcohol, and petroleum; the remainder of the liver cells in the central portion of the acinus were only the frame-work and apparently the cell membrane of the droplets or nucleus. Tarnier and Blot described a similar condition, and others have also written concerning it. Hofbauer reasons that such anatomical alterations must be accompanied or followed by changes in the metabolism and function of the liver.

Hensen's experiments indicate that the anatomical changes and their location are such as would be naturally expected in any disordered state of the individual. When the tissues were stained for glycogen, this was found most abundant in the middle third of the acinus and at its margin. In the inner third of the acinus glycogen seemed to be absent, thus reversing the arrangement of the droplets of fat.

Regarding the derangement in the glycogenic function of the liver produced by pregnancy, various experiments are cited, especially those which call attention to the production of some forms of sugar in the body of the pregnant patient. There is also an interesting relation between the anti-toxic function of the liver and its glycogen contents. When one considers that in pregnancy the liver is largely taxed with the disposal of fetal waste, one can understand the excessive formation or altered production of glycogen in proportion to the successful performance of liver function in disposing of the productions of fetal metabolism.

Hofbauer also calls attention to the relation between alterations in the central portion of the liver acinus in the pregnant woman and the existence of pernicious nausea. In this case leucin and tyrosin were isolated from the blood. Glycogen is largely absent from the liver.

Attention is called to the diagnosis of this condition clinically through the study of the ammonia co-efficient in the urine. A clinical test of liver insufficiency in pregnancy is found in the experimental administration of levulose in large quantities, as great as 60 to 100 gm. The examination of the urine in these cases for albumin, indican, acetone, and acetic acid, with repeated observation of the patient's weight, gave valuable indications of the presence or absence of liver insufficiency. The levulose may be given as powder dissolved in water or tea, upon an empty stomach, and two hours afterward the urine may be examined for sugar.

The examination of the heart of pregnant animals has shown that the nuclei of the muscle substance behave very differently under coloring material in the pregnant and in the non-pregnant. The reason for this alteration in its protoplasm is not clear.

When the kidneys are studied in pregnant patients, evidences of degeneration in the cell nuclei and protoplasm in the cortical tubules is observed. It has been found that the epithelia covering the glomeruli do not show such changes in the protoplasm when treated by coloring material. In many portions of the kidney, histological study finds evidence of a more or less extensive degenerative process. This is considered by Hofbauer as distinctly secondary to the changes described in the liver.

In the skeleton the formation of so-called puerperal osteophytes is described by some as peculiar to pregnancy, and the causal relationship of the phenomenon is questioned by others. In animals, experiment has shown that when the secretion of the ovaries is insufficient, and that of the thyroid in excess, thickening in the walls of the cranium takes place. We know that in myxedema the skeleton is badly developed, and that improvement follows when thyroid extract is administered. When the ovaries are removed, diseased conditions of the skeleton sometimes pass on to recovery, as in osteomalacia. There seems to be a clearly defined antagonism in action between the function of the ovary and that of the thyroid. When tumors of the thyroid develop, their metastases are usually found in the cranial bones.

In pregnancy then, the function of the ovary usually ceases, followed by enlargement and swelling of the thyroid.

Prolongation of Pregnancy. Nassauer[1] reports an interesting case of prolonged pregnancy with missed abortion. The patient was a married woman, presenting the usual symptoms of pregnancy, including enlargement of the abdomen, and supposing herself eight months advanced. On thorough examination the breasts were not enlarged, nor was colostrum present. The abdominal wall was moderately fat, but the tissues were relaxed, and the girth of the abdomen was not very great. The

[1] Archiv f. Gynäkologie, Band lxxxii, 1907.

uterus could not be felt by external manipulation. Internal examination revealed the fact that the uterus was very little, if at all, enlarged, not softened, and anteflexed. Both the patient and her husband could not be brought to believe that pregnancy was not present, and on the day following the examination hemorrhage from the uterus began which became severe, and a blighted ovum was expelled which had developed but a few months only. The patient recovered without complication. As the embryo had escaped, leaving only its envelope, the exact period at which the ovum perished could not be ascertained, but the patient had evidently retained it for five or six months.

For a long pregnancy and its termination, McKerron[1] urges the induction of labor. He cites two cases especially typical and successfully treated by this method. McKerron concludes, from his studies on this subject, that pregnancy is prolonged in 3 per cent. of all cases. This condition is undoubtedly dangerous to both mother and child, and an interruption should not be done as a routine matter until after a thorough study of the case and the recognition of the dangers which the prolongation of gestation may develop.

Bossi[2] believes that pregnancy beyond 285 days is not very infrequent, occurring in 2.3 per cent. of pregnant women. In March, April, and May they are more frequent than at other times. Certain patients seem especially predisposed to the prolongation of gestation. In these cases the fetus has excessive length, a great degree of ossification, and development of the cranial bones, with a decided discrepancy between fetal length, the development of the skeleton, and the weight, which is deficient. When pregnancy is prolonged the fetus tends to lose its fat, while the skeleton increases. Bossi reports 52 cases from 295 to 305 days. The mother has been found in these conditions to be peculiarly liable to uterine inertia. This is probably the result of fatty degeneration of the uterine muscle, which Bossi demonstrated by subjecting a piece of a uterus obtained in Cesarean section to microscopic examination.

Interesting observations have been made by Licester[3] regarding the duration of pregnancy among the Europeans living in India, and also East Indian and native women. In Europeans, pregnancy lasted on the average 279.977 days. The extremes were from 261 to 299 days. In East Indians the average was 276.744 days, while in natives pregnancy lasted on the average 279.972 days.

As regards the weight of the child in Europeans and Eurasians, the weight of the fetus increased gradually as gestation was prolonged. In the case of natives this was not observed.

Schultze[4] discusses the question as to the interval of time elapsing

[1] Journal of Obstetrics and Gynecology of the British Empire, 1907, No. 5.
[2] Gynäkologische Rundschau, 1907, Band i, Heft 1.
[3] Journal of Obstetrics and Gynecology of the British Empire, June, 1907.
[4] Monatsschrift f. Geburtshulfe und Gynakologie, 1907, Band xxv, Heft 5.

between conception and the occurrence of labor. He reviews the statistics of the subject, and recalls Winckel's studies of 30,500 labors, in which 3.3 per cent. were found with children weighing 4000 gm. or more.

Other observers studied the question from the same standpoint of the weight of the child, and found a considerable number of cases in which prolonged pregnancy undoubtedly occurred. A period of from four to six weeks beyond the usual termination of gestation, according to these investigations, is not unusual. According to these studies the average pregnancy varied from 280 to 288 days, with frequent prolongations over 300 days. It must be remembered, however, that from the weight of the child alone one cannot reckon the period of gestation. Differences in the nutrition of the mother, and other conditions, may cause extensive variations in weight.

The Disappearance of Pregnancy. Under this unusual title, Polano[1] reports the case of a woman aged twenty-eight years, married eighteen months, who had ceased to menstruate for three months. She had had vaginal hemorrhage for two days, with moderate fever. On examination, the uterus was four months pregnant, and at the left side of the womb there was a sensitive tumor as large as a small fist. A diagnosis was made of pregnancy and pyosalpinx. The abdomen was opened, the diagnosis of pregnancy confirmed, and the tumor found to be a degenerated cystic ovary. On further examination, both ovaries were found to be degenerated and cystic and were removed, leaving normal Fallopian tubes. The patient made an uninterrupted recovery, without fever, and was kept under observation after leaving the hospital.

The uterus grew steadily smaller without the expulsion of its contents. Nine months after the patient's discharge from the hospital, the uterus was found normal in size, condition, and position, without evidence of pregnancy.

An examination of the ovaries removed showed them to be excessively cystic.

The very interesting question arises as to the fate of the ovum. This must evidently have been absorbed.

The chemical study of Mathes and Liepmann indicates that the placental substance contains ferments which are capable under some circumstances of acting upon the retained ovum or embryo. Other observers believe that the amnion is an active substance forming certain ferments.

Polano's observation seems confirmed by Fraenkel,[2] who observed a multipara who had aborted at three months, followed by curetting. Menstruation then became regular, until symptoms of ectopic gestation developed after several months. The patient was then sent to the

[1] Zeitschrift f. Geburtshülfe und Gynäkologie, 1907, Band lix, Heft 3

[2] Centralblatt f. Gynäkologie, 1907, Nr. 28.

hospital, and upon admission there was found a tumor at the right side of the uterus; the diagnosis lay between ectopic gestation in probably the right tube, or intra-uterine pregnancy with a tumor in the right side of the pelvis.

By abdominal section the cyst was removed, and with it the left Fallopian tube, the ovary having formed the cyst. The fresh corpus luteum was observed in the substance of the tumor removed. Both Fallopian tubes were normal. Nineteen days after operation the patient was discharged in good condition.

For a few days after the operation hemorrhage occurred from the vagina, but the closest scrutiny failed to reveal the presence of any portion of the ovum, or even of the uterine decidua. Fraenkel concludes that a pregnancy can terminate without the expulsion of the ovum or the retention of the products of pregnancy within the uterus. He believes that the ovum and its appendages can undergo dissolution and resorption. This has been repeatedly observed in animals when the Fallopian tubes or corpora lutea have been removed during pregnancy.

The two cases of Polano and Fraenkel confirm previous observations. The very interesting question arises as to whether an ectopic gestation within the tube could undergo a like experience. In Fraenkel's case, the corpus luteum was the site of cystic degeneration, which is often observed in tubal pregnancy.

Pyelitis Complicated with Pregnancy. The literature on this subject increases constantly, and among recent papers, that of Mirabeau,[1] of Munich, is of especial interest. Within the last five years he has observed ten cases, and has made a number of cystoscopic examinations in cases under the care of colleagues.

From his cystoscopic investigation, he believes that in many cases purely clinical observation is not sufficient to avoid error in diagnosis, and that cases reported as pregnancy pyelitis are frequently those of complications of pregnancy arising from other sources.

Observation has shown that this lesion occurs most frequently upon the right side, and many believe that this is the result of compression of the right ureter. By vaginal examination the dilated ureter can often be palpated.

Cystoscopic examination shows the mucous membrane of the base of the bladder greatly swollen and covered with mucus, so that it is often difficult to find the opening of the ureter. Mirabeau believes that the cause of dilatation of the ureter is not so much pressure at the brim of the pelvis as the swelling of the mucous membrane of the bladder and the occlusion of the cystic orifice of the ureter.

He reports in detail ten cases with characteristic symptoms in the human subject. He also describes ten experiments to determine the cause of this condition:

[1] Archiv f. Gynäkologie, 1907, Band lxxxii.

(1) Ligating the ureter of a rabbit with sterile ligatures, the hydronephrosis which followed was sterile. (2) When into a vein of these animals with ligated ureters colon bacilli were injected, these bacilli were found in the hydronephrosis. (3) If, however, the colon bacilli were injected into the bladder, the hydronephrosis remained sterile. (4) In cats in which the ureters had been ligated, if the cecum were sutured to the capsule of the kidney the hydronephrosis contained colon bacilli. (5) In these animals the kidneys showed the characteristic picture of a congested hydronephrosis without inflammatory alterations.

Mirabeau concludes from his study of the subject that under the name "pyelitis of pregnancy" are included a number of conditions which do not properly belong under this category. Such are gonorrheal infection, infection with the micrococci of suppuration, infection with the colon bacilli, and tuberculous infection. Each of these groups has its own pathology, symptomatology, therapy, and prognosis, and can be clearly distinguished from other groups. The infection travels in different channels, and in gonorrheal cases is an ascending infection, in pus cases an ascending or descending, and in tuberculous and colon bacilli, cases of descending infection.

Pregnancy produces the following changes which tend to favor infection:

The pressure of the growing uterus brings about topographical alterations of the urethra, bladder, and ureter. The hyperemia and swelling of the mucous membrane of the bladder accompanying pregnancy impedes the discharge of urine from the ureter. The condition of the kidney peculiar to pregnancy encourages the chemical changes in the urine following its retention in the kidney. The pressure of the uterus and the fetus upon the right ureter does not seem to be the determining cause for the occurrence of pyelitis so frequently upon the right side. The cause of this condition is found in the proximity of the ascending colon, filled with feces, to the right kidney, whose position is frequently altered during pregnancy.

Experiments upon animals have been made by Rovsing and Barlow to determine the nature of the *cystitis* so often observed in pregnancy. They distinguish two varieties: One produced by bacilli, especially the tubercle bacillus and the bacillus coli communis, and the other caused by the gonococcus, staphylococcus, streptococcus, and Diplococcus pyogenes. Cultures of these bacteria in full vigor can produce the same cystitis when placed in a healthy bladder with intact epithelium. In pregnancy the factors of retention, hyperemia, and trauma are present, and favor the development of cystitis. Usually the active infection is introduced from without by catheters or sounds; less frequently, by the spontaneous passage of germs from the bladder along the ureters to the pelvis of the kidney.

Experiments upon animals by Schmidt and Aschoff show that the

bacillus coli communis is the most frequent agent in causing cystitis and ascending pyelitis. The exact method of infection cannot be positively demonstrated. Posner and Lewin have shown that the colon bacillus can pass through the wall of the intestine.

The Presence of Bacteria and Pus in the Urine in Pregnancy and after Parturition.—A most interesting article upon this subject is published by Albeck.[1] The material for his study was obtained in the obstetric wards of the hospital at Copenhagen in the service of Professor Myer.

It is the rule of the clinic that all parturient patients are catheterized and the urine examined. If albumin is found, the urine is centrifuged and examined microscopically Where evidences of disturbance of the kidney are present the urine is examined on the fourth and seventh day after labor, and for each three days during the puerperal period.

In 7648 parturient patients pus was present in the urine in 5.86 per cent. It is most frequent in primiparæ, and less frequent in multiparæ. The age of the patient was without influence. These patients were examined by the cystoscope and by catheterization of the ureters. The mucous membrane of the bladder was found swollen during pregnancy and in a generally hyperemic condition.

Albeck divides his cases into those in which pyuria was present with fever, those in which there was no fever but pyuria was found, and those in which bacteria were abundantly present in the urine.

He reports 52 cases of pyuria complicated by fever: 27 were primiparæ and 25 multiparæ, and fever appeared during the tenth month in 18, during the ninth month in 11, and then with diminishing frequency until the fifth month. Fever was preceded by chills, after which the temperature rose to 104° F., often falling in the morning to 98 or 96.5°. The pulse was comparatively low, from 100 to 110. In some cases there was pain in the region of the kidney before the temperature rose; in others the pain appeared with the temperature. In 31 of these cases the right kidney was affected, in 9 the left, and in 12 both. During pregnancy the patient was very sensitive to palpation in the region of the kidneys; after the birth of the child palpation occasioned no disturbance. The urine in these cases was cloudy, with pus, and offensive in odor. The urine obtained from the bladder was examined for bacteria in 22 cases, in all of which the bacillus coli communis was found in 20 in pure culture. Catheterization of the ureters in 12 cases showed the urine to contain pus from at least one of the ureters. In 20 of these patients fever did not appear until labor.

An incorrect diagnosis of puerperal septic infection was made in some of these cases, but a correct diagnosis is possible when the urine is carefully examined and the character and frequency of the pulse are

[1] Zeitschrift f. Geburtshülfe und Gynäkologie, 1907, Band lx, Heft 3.

observed. In 15 of the patients labor speedily developed, which was terminated as the indications demanded.

In 32 patients the fever began from a few days to several months before labor; 15 of these patients had labor prematurely; and in 6 cases pregnancy had to be interrupted. This was accomplished by the use of De Ribes' dilating bag, which excited spontaneous expulsion.

The history and postmortem report of a case of pyelonephritis of pregnancy is given by the author. In the other 51 cases improvement speedily followed parturition. During the puerperal period some of these patients had a rise of temperature, which gradually subsided.

Among the very interesting cases reported is that of a patient who developed pyuria six months after the birth of the child. Her condition became so serious that under ether the right kidney was exposed, found adherent, and greatly altered by the development of fibrous tissue. A small calculus was removed by incision and a piece of the kidney substance excised for examination. A microscopic study of this portion showed a contracted kidney with dilated channels and hyaline glomeruli. After operation the patient's temperature rose to a great height; she complained of headache and vomited persistently; diuresis was very scanty. With hypodermoclysis the secretion of urine increased, and the patient gradually recovered.

So far as treatment is concerned, salol was found of advantage. Under good hygienic conditions and careful nursing most of these patients recovered.

Albeck distinguishes some cases of pyelitis in pregnancy which are without fever, and which he styles the latent form. He cites cases in which the urine contained a great number of colon bacilli but the patients did not have fever. Severe pain was complained of in the region of the kidneys. These patients had abundant diuresis. The urine contained pus in abundance, and in the majority of them the bacillus coli communis was in pure culture. The condition was noted most frequently in primiparæ. An attempt was made to ascertain whether the pus came from the bladder or kidneys, or through one ureter only. In the majority of cases the pelvis of the kidney was the seat of infection; in a few months after labor the pus disappeared from the urine at intervals, varying with each patient.

Albeck also calls attention to cases in which bacteria are present in the urine with but very little or no pus. He cites the case of a primipara, aged twenty-two years, with tenderness over the right kidney, and an abundant secretion of urine which was rich in bacteria. After the birth of the child the patient had slight fever with a fetid vaginal discharge.

In 32 cases the bacillus coli communis was present in 24, and streptococci in the remainder. In none of these cases did the urine contain albumin. Where the colon bacillus was present the urine was acid and cloudy; where streptococci and staphylococci were found the urine

contained flecks of albuminoid material and was either alkaline or amphoteric in reaction.

In studying these cases Albeck found that the infection dated from the beginning of pregnancy; and in many cases it must be believed that the infection of the urinary passages had been present before pregnancy.

The prognosis for the child was distinctly better than that given by Opitz; 37 out of 52 children were born at the average termination of pregnancy, or but a very few days before; others were prematurely born, and 5 were born by induced labor; one patient aborted; one died two days after birth.

The treatment of the pyelitis of pregnancy must depend upon the condition of the patient. If labor must be terminated the appropriate obstetric operation is indicated. If the patient is not in labor, she may be treated by catheterizing the ureters, by nephrotomy, or by interrupting the pregnancy. It seems impossible to understand how simply catheterizing the ureters may bring about a cure in these cases, and yet improvement has followed this procedure. After nephrotomy patients usually improve rapidly. The induction of labor was performed in 6 cases out of 52, in which the patient had considerable fever and was greatly prostrated.

Albeck concludes that pyelitis may develop in both pregnant and parturient patients. Some cases have pronounced fever with pain over the kidney; more often there is no fever and frequently no pain. In former times these cases were considered catarrhal cystitis.

Pyelitis begins invariably in pregnancy and is really a disorder separate from the pregnancy. The prognosis is serious, for the condition, if acute, may threaten the patient's life; and if this does not occur, pyuria may develop into a persistent bacteriuria, which may render the patient capable of leading her usual life for some time.

In dealing with pregnant patients, the expectant treatment should, as a rule, be employed. If the patient be put at rest in bed, with appropriate diet, the grave symptoms often subside spontaneously.

In this connection attention may be called to Cragin's paper upon this subject,[1] reporting 17 cases; also to an article in the same journal for May, 1907. Cragin's observations agree with those of Albeck, and he is inclined to give a very favorable prognosis. Gugisburg[2] observed 9 cases of this disorder in the obstetric clinic at Bern. He found the bacillus coli communis the infective agent, and recognized gastro-intestinal disturbances and diarrhea as frequently preceding the pyelitis. When the infection arose through the blood current the attack was especially violent. In some cases the bladder remained uninfected. He obtained the best results in treatment by having the patient at rest

[1] Surgery, Gynecology, and Obstetrics, 1907, vol. ii, No. 5.

[2] Schweizer Korr, 1907, Band i, Nr. 7.

in bed, and lying upon the side opposite the affected kidney. He also practised distention of the bladder with 200 or 300 c.c. sterile fluid, and the rapid withdrawal of the same. A milk diet, and the administration of salol or urotropin were also indicated. If the fever became high or increased, pregnancy was terminated.

Ruppauer[1] concludes from the study of ten cases in the clinic at Basle that the disorder begins most frequently in the middle of pregnancy. He had especially good results from the administration of aspirin and irrigation of the bladder. He prefers nephrotomy to the interruption of pregnancy.

I have recently had the opportunity to study a typical case of pyelitis in pregnancy occurring in a neurotic multipara. Adhesions following abdominal section so limited the mobility of the uterus that in a succeeding pregnancy premature labor developed as the result of irritation. Especial care was employed to limit catheterization and to maintain asepsis. After the first week of the puerperal period moderate fever developed, which could not be recognized as septic or of uterine origin. During pregnancy the patient had complained of pain in the region of the right kidney and extending along the ureter; the urine also contained abundant leukocytes. Its reaction had always been acid. With rest, and a milk diet, and the plentiful use of saline water, the condition gradually improved.

Examination of the blood showed no anemia and no pronounced leukocytosis. The pain and tenderness along the kidney disappeared, and the patient made a tedious but satisfactory recovery.

The urine showed abundant bacteria, most of which were the Bacillus coli communis.

Wallich[2] recognized two types of *albuminuria in pregnancy*, the first accompanying nephritis, while the second is the result of an auto-intoxication. He considers a third form as being much more rare, and describes this as the albuminuria of pylenephritis. In 15 cases examined at the seventh month, 6 gave a history of some disturbance of the urinary organs in the early months of gestation.

Pregnancy Complicated by Disease of the Pelvic Viscera. We recognize the fact that pregnancy may be frequently complicated by disease in the uterus, tubes, ovaries, and surrounding tissues. The development of ovarian tumors during pregnancy requiring operation is not a very rare occurrence. Operation was formerly declined for ovarian tumors through the fear of interrupting pregnancy, based largely upon the statistics of Fehling, Wähmer, and others, who gave a percentage of interruption varying from 24.3 to 16.

Flatau[3] has collected 284 cases of *ovariotomy during pregnancy*. In 49 cases pregnancy was interrupted, a percentage of 17.2. When

[1] Munch. med. Wochensch., 1907, Nr. 6.
[2] Presse Méd., 1907, No. 2.
[3] Archiv f. Gynakologie, 1907, Band lxxxii.

his statistics are analyzed, the results are 277 ovariotomies, with 42 interruptions of pregnancy, or 15.1 per cent. If cases which showed complication, rendering the interruption of pregnancy inevitable without operation, are excluded, there remain 262 ovariotomies, with 27 interruptions of pregnancy, or 10.3 per cent.; if the method of ovariotomy be considered, the superiority of operation by abdominal section over that by vaginal section becomes apparent. After vaginal section, 49 per cent. of pregnancies were interrupted.

A study of these cases also shows that it is well to avoid the extreme Trendelenburg posture in operating. There is greater tendency to intra-uterine hemorrhage, and also to disturbances of the abdominal viscera if this be practised. The tumor should be carefully and gently removed and the vessels in the pedicle separately ligated. Exposed points should be covered with peritoneum and sutured with catgut. Most thorough aseptic precautions are necessary, and that method of anesthesia should be employed which will be followed by the least vomiting and cough. The use of chloroform and oxygen is beneficial.

The contrary side of the argument as to the method of operation is presented by Democh.[1] He collected 21 cases from the literature, 17 operations having been performed between the first and fifth months. In two, the colpotomy was anterior, and the remainder posterior. All the mothers recovered, and pregnancy was interrupted in 3 cases, or 17.65 per cent. The mortality for the children was 4.76 per cent. Democh has collected statistics of abdominal ovariotomy in pregnancy, giving a mortality of between 5 and 6 per cent.

The statistical argument for selecting a given operation is far from conclusive. Two circumstances must weigh heavily against vaginal ovariotomy in pregnancy. The first is the difficulty of removing a tumor of considerable size through the vagina, especially in primiparous patients. The second is the fact common to all abdominal sections, that by abdominal section the operator has a much wider field of observation, much better command of hemorrhage, and much greater ability to deal with complications, than by the vaginal method. In selected cases of multiparæ with a capacious pelvis and relaxed tissues, vaginal ovariotomy in pregnancy for small tumors may be successfully performed. In the majority of cases abdominal section must be preferred.

In this connection a rather unusual case of *cancer of the ovary* complicating pregnancy is reported by Zickel.[2] The patient was a primipara having a tumor semisolid in nature in the pelvis. An effort was made to replace the tumor above the pelvic brim when a portion of it was felt to rupture. Abdominal section was immediately performed and the tumor removed. The patient went on in pregnancy and was delivered of a living child, which died a few days after birth with sudden

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxvi, Heft 2.

[2] Zentralblatt f. Gynäkologie, 1907, Nr. 14.

hemorrhage. The patient subsequently died from cancerous growth in the abdominal viscera.

Pregnancy Complicated by Fibroid Growths. Operators are accustomed to treat cases of fibroid tumor complicating pregnancy with reference to the position of the fibroid and the complications which it causes during pregnancy. A tumor so situated that it will not impede the development of the fetus and its descent into the pelvis, and which causes no complications during pregnancy, should not be subjected to operation. Such a tumor may disappear during the puerperal involution, or grow so small as to occasion no inconvenience. On the contrary, it may be so situated as to require not only the removal of the tumor, but also hysterectomy.

Kayser[1] reports the case of a woman, aged forty-three years, whose menstruation had been profuse, and who had in addition to pregnancy a myoma as large as the head of an infant, upon the anterior uterine wall. This tumor had increased greatly in size, while the health of the patient was much impaired. So rapid was the tumor's growth that it was suspected of malignancy.

In the interests of the mother hysterectomy was performed, and a tumor weighing thirteen pounds and the body of the uterus were removed. The patient made a good recovery.

Bland-Sutton[2] reports an interesting case of a primipara, aged thirty-nine years, in the fourth month of pregnancy, who after a long journey in a motor car was taken with severe pelvic pain and discomfort. Vomiting and great distention of the abdomen developed. These symptoms persisted for three days, when the bowels finally acted and the pain slowly subsided.

On examination a large fibroid was found springing from the cervix and firmly wedged into the pelvis. It could not be dislodged by pressure. This tumor had increased greatly in size, and was so situated as to make delivery of the fetus impossible. Accordingly, hysterectomy was done, from which the patient made a good recovery. The fibroid was found to arise from the supravaginal portion of the cervix, unfolding the left broad ligament. Its rapid increase in size had produced symptoms closely simulating the twisting of the pedicle in an ovarian tumor.

Pregnancy in a Uterine Cornua. This interesting condition, sometimes difficult of diagnosis, is carefully described, with illustrations, by Limnell.[3] A diagnosis was made of tubal gestation, unruptured, and the abdomen was accordingly opened for the treatment of this condition. Instead of tubal gestation, pregnancy in the uterine cornua was present. The cornua and its contents were removed and the broad ligament sutured, the body of the uterus being allowed to remain. After the

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 1.

[2] Journal of Obstetrics and Gynecology of the British Empire, December, 1907.

[3] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 2.

operation the patient had some pain in the abdomen, and hemorrhage from the vagina, which subsided with the administration of ergot. Decidua was discharged from the vagina during convalescence. The patient made a good recovery, and has since given birth to three children, all of them in breech presentation.

The illustrations show clearly the villi of the chorion with fatty nuclei, and the presence of abundant leukocytes in the spaces between the villi. A transverse section of the envelope of the embryo shows the amnion and chorion and their relation to the degenerate villi and zone of cell formation. One of the illustrations shows the appearance of the entire tumor.

Retroversion of the Pregnant Uterus is always a complication of more or less gravity, and may come to the point where the safest treatment of the condition may be abdominal section.

Pestalozza[1] has collected 31 cases in which the abdomen was opened for retroflexion of the gravid womb. He adds a case in his own experience. The patient was a primigravida, who had the usual symptom of difficulty in micturition. After the bladder had been emptied by catheter, the uterus was found retroflexed, and on the right side of the abdomen a tumor in addition to the uterus. Efforts at replacing the womb failing, abdominal section was performed, when a small suppurating dermoid tumor of the ovary firmly attached to the omentum and right Fallopian tube, and a retroflexed womb, were found. The ovarian tumor was removed and the uterus replaced. The patient recovered without the interruption of pregnancy.

Küstner[2] describes his experience with a multipara whose principal symptom was pronounced *ischuria*. The patient had a retroflexed pregnant uterus which could not be replaced. Adhesions were evidently present and abdominal section was performed. At operation, numerous but thin fibrous adhesions between the posterior wall of the uterus, the tubes, ovaries, peritoneum surrounding the rectum and posterior pelvic wall were found. These were separated manually; and those especially firm by the cautery; they extended down the posterior cul-de-sac as far as the cervix, the vaginal wall, and the peritoneal tissue. After the adhesions had been loosened no difficulty was experienced in replacing the uterus. A pessary was worn after the operation and the bladder was continuously drained by catheter for eight days. Pregnancy was uninterrupted, the patient going to full term and being successfully delivered.

It is unusual to observe retroflexion of the uterus in the last months of pregnancy, but Lange[3] describes such a case. The patient previously had had three tedious but spontaneous labors. During the fourth

[1] La Ginecologia, January 15, 1907.

[2] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 5.

[3] Ibid.

pregnancy she had much abdominal pain, and came into labor without making progress. The occasion for delay seemed to be a tumor in the pelvis, which could not be replaced.

On admission to the hospital the uterus was in a condition of tetanic contraction and the child could not be palpated. The breech was presented. The highest portion of the uterus was three fingers' breadth above the umbilicus, but the head could not be felt at this point. A portion of the fetus could be made out behind the abdominal wall and behind the intestine. The heart sounds were heard on the left side in the region of the umbilicus and were regular and loud.

On vaginal examination the entire small pelvis was filled with a tumor The vagina was drawn high up behind the symphysis and at the upper border of the symphysis the os uteri could be felt permeable for two fingers. This led to a canal or duct 4 cm. long, at the end of which the breech of the child could be made out. The membranes had ruptured, and a diagnosis was made of partial retroflexion of the pregnant uterus. On measuring the pelvis, it was found to be a simple flat pelvis.

Under anesthesia the tumor could not be replaced, nor could the feet of the child be reached. Accordingly, abdominal section was performed, adhesions were broken up, a transverse incision made across the fundus, and the child extracted. The placenta was readily separated, but the adhesions between the lower portion of the uterus and surrounding tissue could not be separated, and were cut with scissors. Hemorrhage from the uterus was so severe, as uterine contraction failed utterly, that supravaginal amputation was performed. The patient did fairly well in the puerperal period until four weeks after labor, when pulmonary embolism developed with fever. Nine days later a second embolism occurred, from which the patient made a tedious recovery. Her entire convalescence occupied six weeks. The child flourished.

On examining the extirpated uterus, the uterine walls varied greatly in thickness. The retroversion had practically divided the uterus into two portions at about its lower third, almost occluding the cervix. The child was at full term, possibly more, and the mother had had no symptoms of incarceration. No clear history was given as to the original cause for the condition.

Pregnancy after Operation for Inversion. It is interesting to learn the course of pregnancy in labor after operation for chronic inversion of the uterus. Born[1] operated upon a patient, in 1901, for chronic inversion of the uterus. This patient afterward was under his observation, when he found that chronic hemorrhage had given place to regular menstruation, and that a normal pregnancy occurred and went successfully to full term. Labor proceeded rapidly, and there was some hemorrhage when the placenta separated. The patient made a good recovery.

[1] Zentralblatt f. Gynäkologie, 1907, Nr. 4.

Keilmann[1] also operated upon a patient for chronic inversion of the uterus, by Küstner's method. The operation was successful, the uterus remaining anteflexed and freely movable.

A succeeding pregnancy terminated in rapid labor, followed by profuse hemorrhage when the placenta partially separated. The physician who was called removed the placenta manually. It had been attached upon the anterior uterine wall. Both mother and child recovered well.

While two cases are not sufficient to form a positive judgment, one would infer from this experience that in pregnancy following operation for chronic inversion the attachment of the placenta is not normal and that there is a tendency to hemorrhage when the placenta separates.

Chorio-epithelioma Outside the Uterus. Hicks[2] reports the case of a patient admitted to the hospital with pneumonia. She had hemorrhage from the uterus, and a large hydatid mole with a five and a half months' dead fetus were removed from the uterine cavity. The patient did not do well, and there was a blood-stained discharge of a dark venous color which had persisted since the previous abortion.

On examination two tumors were found upon the vaginal wall, dark bluish purple in color; the upper one of these was a soft cystic swelling covered with mucous membrane; the lower was hard and bluish purple in color. Under anesthesia the smaller tumor was removed. After this the patient made a prompt recovery. The upper cystic tumor spontaneously disappeared.

On examining the hard tumor removed it was found to be a syncytioma malignum.

Other tumors subsequently developed in the vagina, and death finally ensued.

At autopsy, metastases were found in the right lung, while the vagina was extensively involved.

Hicks has collected 14 cases of primary vaginal chorio-epithelioma, two of them resulting fatally, with secondary growths in the lungs, kidneys, and liver, but none in the uterus. The other patients apparently completely recovered.

These vaginal growths follow the passage of a vascular mole, but may also occur after abortion or full-term pregnancy. They may develop while the mole is still in the uterine cavity, or originate from the epithelium of migratory embolic villi. The growth seems to spread by the perivaginal veins and there is no means of telling whether any given mole will be followed by malignant growth.

Syncytioma Malignum of the Placenta. I have recently had in my own experience an interesting case of this complication. The patient, an anemic primipara, had a spontaneous labor complicated by hemorrhage before and after expulsion of the child. After the fetus

[1] Zentralblatt f. Gynäkologie, 1907, Nr. 13.

[2] Journal of Obstetrics and Gynecology of the British Empire, August, 1907.

had been expelled the placenta was found partly separated, and there was a considerable mass of clotted blood in the uterus. This was removed, the uterus thoroughly irrigated and packed with gauze, when the bleeding ceased. The patient recovered from labor without complications, but with a decided anemia.

On examining the placenta several masses of syncytial tissue were found in its substance, whose identity was plainly established by microscopic examination. The patient, however, presented no sign of uterine involvement or secondary growth, but in order that a more thorough examination might be made curetting was performed under ether. The pelvic organs were found normal, the uterus fairly involuted, but soft. On curetting, blood came freely from the uterine cavity, but when the blood-clot and scrapings were examined no syncytial tissue could be found. Under these circumstances, the patient has been discharged between five and six weeks after labor in apparently good condition.

The question naturally arises as to the duty of the physician in any case where abortion or labor has been complicated by hemorrhage accompanying the presence of syncytial tissue. If uterine involvement can be recognized, hysterectomy is the duty of the operator, but in the absence of such evidence the operation should not be undertaken. It seems, however, necessary, before allowing such cases to go from observation, to perform a thorough curetting with examination under ether, and to examine the scrapings microscopically.

Perityphlitis and Appendicitis Complicating Pregnancy. The literature upon this subject is already considerable, and the following papers seem worthy of notice.

Calmann[1] draws attention to perityphlitis complicating pregnancy, and believes that it is usually complicated by appendicitis, and that the two cannot practically be differentiated. He reviews the literature to some extent, and quotes Rosthorn, who in 27,000 obstetrical cases saw severe appendicitis but twice, and these cases came under observation within four days. He believes that very mild inflammation of the appendix complicating pregnancy recovers under the simplest treatment, and quotes a case in support of this belief. The earlier the pregnancy the less the mortality when appendicitis is present as a complication. As pregnancy advances the uterus presses upon the bowel and furthers the formation of adhesions and of abscess. He describes a case of appendicitis causing abortion and proving fatal from perforation. Operation failed to save the patient.

Statistics which he has collected seem to show that operation does not increase mortality or the danger of abortion, but, on the contrary, gives a distinctly favorable prognosis. If peritonitis has begun before the operation, the danger of abortion is much greater. In his own experi-

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxvi, Heft 4.

ence he operated for empyema of the appendix, with an excellent result and without disturbing the pregnancy. In another case peritonitis had begun, and while the patient recovered, pregnancy was interrupted. In a case of chronic appendicitis, with repeated attacks, operation was successful, and the pregnancy continued. In a case of mild appendicitis complicating the puerperal state, the patient recovered without operation; while in another puerperal case, subinvolution of the uterus was present until the appendix was removed, when the patient made a complete recovery. The same result followed the removal of the appendix after abortion, subinvolution remaining pronounced.

In one instance Calmann operated upon a woman seven months pregnant for chronic appendicitis, with an excellent result. His most severe case was one of phlegmonous appendicitis with abscess in the mesentery. After operation a dead and macerated fetus was expelled, and recovery was complicated by thrombosis of both femoral veins; the patient finally obtained a good result.

Stähler[1] reports a case of pregnancy complicated by appendicitis with perforation. Upon operation purulent fluid escaped from the abdomen and peritonitis was present. The appendix was removed and the abdomen drained by a Mikulicz tampon. The expulsion of a dead fetus occurred shortly afterward, followed by septic infection. This was treated by antistreptococcic serum, but the patient developed signs of suppuration with subphrenic abscess. This was drained, when it was necessary again to open the chest wall for another collection of pus. By free drainage and irrigation the patient finally made a complete recovery.

He adds a detailed report of 12 cases which he has collected.

Füth[2] calls attention to the tendency of perityphlitic abscesses complicating pregnancy and labor to sink into Douglas' pouch—a favorable circumstance for the establishment of drainage. Before the fourth month of pregnancy the uterus fills the pelvis so completely that the tendency is not so manifest. As the uterus grows the cecum is drawn upward toward the liver and the appendix also. This increases greatly the mortality of these cases.

A study of the literature of the subject and my own experience leads me to urge strongly the necessity for early operation in appendicitis complicating pregnancy. No possible good can be obtained by delay, which increases greatly the patient's danger. Medicinal treatment in these cases is uncertain.

Another point of importance is the fact that where there is evidence of infection or inflammation in the right lower portion of the abdomen in a pregnant woman, it may be impossible for the operator before the abdomen is opened to know definitely whether appendicitis or salpin-

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxvi, Heft 2.

[2] Münchener med. Wochenschr., 1907, Nr. 9.

gitis, or both, are present. Both are serious complications of pregnancy, and both tend to become more fatal as pregnancy advances. An incision should be made in such a manner that the right tube and ovary and the appendix can be thoroughly inspected, and should either or both of these organs be found the site of infection, removal is the only remedy.

Cardiac Disease Complicating Pregnancy and Labor. Wenczel[1] reports 8 cases of cardiac disease complicating pregnancy and labor. All of them were suffering severely from failing compensation; 2 were pregnant; 6 were in labor, in 4 of them compensation had begun to fail before pregnancy, and all of these women died. In 3 cases compensation began to fail in the first half of pregnancy, and in one in the second half. These patients were variously treated, in one case by therapeutic abortion, and of the 8 cases, 6 died, and two children of these mothers survived; of the 8 cases, 3 went to full term, 2 had abortion, and 3 premature labor; 3 of them had mitral regurgitation, and 2 of these recovered; 3 had stenosis of the left pulmonary orifice, 1 aortic insufficiency, and 1 degeneration of the myocardium.

In 10,998 labors, 7 cases of cardiac disease with great disturbance of compensation had been observed; the eighth case was a Polyclinic case. Mitral stenosis seems especially dangerous in these patients, while in aortic lesions the most common is aortic insufficiency.

The question as to whether the parturient woman having heart lesions should nurse her infant is discussed by Le Roux.[2] He describes a number of cases from the Tarnier Clinic in Paris, and concludes that one cannot dogmatically decide that all patients having lesions of the heart should not be allowed to nurse the child. This decision must be based upon the general health of the patient, the degree of cardiac compensation present, and the condition of the heart muscle. If these factors are favorable, the mother may nurse the child oftentimes to advantage.

Pollak[3] draws attention to the frequency of mitral disease in pregnancy, and believes that many cases where compensation is good are not recognized. When compensation is failing and pregnancy supervenes, the condition of the patient speedily becomes worse. Active danger frequently does not develop until labor begins, although in pregnancy such a patient is exposed to hemorrhage and premature separation of the placenta. Complications in the respiratory organs and kidneys are not infrequently observed.

Much can be done to improve the health of these patients by medical treatment during pregnancy.

Hofmeier[4] considers cardiac disease with failing compensation in many cases a justifiable cause for the interruption of pregnancy. He

[1] Monatsschrift f. Geburtshülfe und Gynakologie, 1907, Band xxvi, Heft 1.

[2] L'Obstétrique, Mai, 1907.

[3] Munchener med. Wochenschr., 1907, Nr. 36.

[4] Deutsche med. Wochenschr., 1907, Nr. 17.

describes a case complicated by cardiac lesions, contracted pelvis, and malformation of the uterus with transverse position of the fetus, successfully treated by the Porro operation.

Blacker[1] believes that pregnancy frequently produces little or no effect upon the organs of circulation. In some cases the right side of the heart is affected, and fatty degeneration of the heart occurs in toxemia. Slight degrees of valvular lesions are often found, but severe cases are comparatively rare. In 55,000 labors Blacker collected 131 cases of pronounced heart lesions, the majority of which were mitral disease. About 40 per cent. of these patients aborted.

When death occurs it is usually from failure of compensation or degeneration of the heart muscle. In labor, death may happen from apoplexy, embolism, or cardiac failure. In the puerperal period the heart may fail from overdistention of the right side, which usually occurs at the latter part of labor, or from distention with blood of the large abdominal vessels, or from degenerative changes in the muscle of the heart.

If the patient who has heart disease is young, with no other disorder, and in good health, there is no reason to forbid her marriage.

Newell[2] reports 3 cases of valvular disease of the heart complicating pregnancy, 2 of whom died during the latter part of delivery.

These patients had received medical treatment for the condition, but were unable to endure the strain of labor. It is evident that such patients require especial watchfulness in pregnancy, with the interruption of gestation so soon as compensation begins to fail. Labor must be made as brief as possible and the patient spared all strain and exertion.

Tuberculosis Complicating Pregnancy. Physicians have long recognized the fact that pregnancy in a patient already tuberculous is a serious complication. Tuberculous laryngitis in pregnancy has been studied by Barthis,[3] who finds that this complication does not usually result in the interruption of pregnancy. Pulmonary tuberculosis is usually present, and often develops early in pregnancy. Where tuberculous laryngitis develops before pregnancy, the prognosis is very grave. Death usually occurs during the puerperal period.

The infant mortality in these cases is as high as 36 per cent. Much can be done to mitigate the suffering of these patients during pregnancy by medical treatment, and tracheotomy is occasionally necessary. The induction of abortion has no effect upon the tuberculous laryngitis, while premature delivery is followed by rapid increase in the disease. The mother should not nurse the child, which should be taken from her after birth to avoid infection.

Pradella,[4] while at Davos, had abundant opportunity to observe cases

[1] British Medical Journal, 1907, vol. i, p. 1225.

[2] Surgery, Gynecology, and Obstetrics, May, 1907.

[3] Thèse de Paris, 1907.

[4] Archiv f. Gynäkologie, 1907, Band lxxxiii, Heft 2.

of pregnancy complicated by tuberculosis. He quotes abundant statistics to show that pregnant patients are favorable subjects for tuberculous infection, as between 20 and 30 per cent. of tuberculous women can date the beginning of their disease to pregnancy. In all, Pradella collected from the literature records of 1035 cases. The unfavorable influence of pregnancy upon tuberculosis seems to be without regard to the stage of the tuberculous disease. Few pregnant women having tuberculosis die during the pregnancy, but in three-fourths of all cases of spontaneous delivery the tuberculous process is much worse after birth.

It is interesting to observe that seven-tenths of these patients were in the third ten years of life. The occurrence of nausea and vomiting in pregnant patients favors the development of tuberculosis, especially in the larynx and intestines. Among tuberculous women, conception is not at all unusual, and the interruption of pregnancy is determined by the severity of the tuberculous process. The course of labor is not especially influenced by the disease. The puerperal period, however, is seriously complicated.

The writer quotes 22 cases in the clinic at Zurich in which pregnancy had been interrupted because complicated by pulmonary tuberculosis. In most of these the operation performed varied in pregnancy. In 15 cases anesthesia was employed without injury to the patient; 80 per cent. of these patients who had done badly during pregnancy, improved after the uterus was emptied. In general, a positive result was obtained in 74 per cent. by operation, and a negative result in 26 per cent.; 6 patients died after delivery, 1 after five weeks, 2 after six months, 1 after one year and two months, and 1 after two years and nine months. In 4 of these patients the tuberculous disease had been a serious complication.

In cases of pregnancy complicated by tuberculosis a thorough painstaking effort should at once be made to improve the patient's condition by therapeutic measures. Where, however, there is evidence that the tuberculous process is an active one, and treatment does not succeed in holding it in abeyance, especially when the fetus is not viable, pregnancy should be interrupted. That method should be employed which will do the patient the least harm, and anesthesia is well borne in these cases. After delivery the patient should remain under observation until her case has definitely declared itself and every effort has been made to cure the disease. Conception should be avoided after such a pregnancy for at least two years.

Rosthorn[1] believes that in tuberculous patients in whom the condition is stationary, in whom the physical signs in the lungs are favorable and there are no tubercle bacilli in the urine, and who are well nour-

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, Band xxiii, Heft 5.

ished without fever and hemorrhage, tuberculosis exerts very little, if any, unfavorable influence. In cases where the tuberculous process is recent, thoroughly localized, and the patient has no fever and is well nourished, pregnancy also produces little result. When, however, the tuberculous lesions have invaded the middle and inferior lobes of the lungs, pregnancy exerts a very unfavorable influence. In cases where the tuberculosis is not only pulmonary, but has extended to the heart, the genito-urinary organs, the intestines, or the larynx, and when there is an hereditary tuberculosis, pregnancy hastens the process very appreciably.

If the patient is in a favorable condition and doing well, the treatment should be expectant. Especial attention should be paid to the patient's hygiene and nutrition. When, however, the patient ceases to improve the weight remains the same or grows less, the question of interrupting the pregnancy must be considered. In very rapid tuberculosis with obstinate fever, this condition must be terminated as soon as possible. Each case must be decided after the most thorough investigation and minute study.

Beit[1] calls attention to the fact that while tuberculous patients may feel well during pregnancy they fail rapidly during the puerperal period. If during pregnancy the patient gains regularly in weight, pregnancy should not be interrupted, but when there is loss there is no reason to delay. Fever alone is scarcely an adequate ground for interference and the presence of tuberculosis does not indicate abortion, but the reaction which the body manifests against the infection is the important indication. Cases of tuberculosis of the larynx and those complicated by frequent vomiting are especially unfavorable.

Weinberg, from the study of statistics, does not believe that tuberculosis is necessarily fatal in the puerperal period. Neu places especial reliance upon the temperature, while Averke believes that pregnancy invariably excites an existing tuberculous process to great activity. He quotes the case of a patient who had recovered from tuberculosis six years previously, who became pregnant and whose pregnancy was interrupted because of a threatened return of the tuberculous process. In spite of this, in the second month of pregnancy, tuberculosis returned with increased violence.

Schaeffer believes that in primiparæ who are tuberculous, therapeutic abortion has a bad prognosis. In multiparæ who are failing in health the interruption of pregnancy seems indicated.

Weinberg[2] believes that pregnancy complicated by tuberculosis will frequently be interrupted, especially in severe cases. The children of tuberculous mothers are often stillborn, and most of them where the process has been severe, die in the first year of life.

[1] Berliner med. Wochenschr., No. 44, p. 1532.

[2] Beiträge zur Klinik der Tuberkulose, Band v, Heft 3, p. 259.

In the first four weeks of the puerperal period the mortality of tuberculous patients is very high, but this is owing in great part to frequent abortion or miscarriage which precedes the puerperal period. The immediate mortality of tuberculous women who die undelivered during pregnancy is relatively small. Pregnancy is interrupted so frequently that a considerable portion of the severest cases do not come under observation in the pregnant condition.

The course of tuberculosis complicating pregnancy is not invariably unfavorable. Tuberculosis is not exceedingly common in pregnancy. In mild cases of tuberculosis pregnancy does not seem to exert an unfavorable influence. Unfavorable social conditions exert a great influence upon the origin and course of tuberculosis in pregnant patients. Therapeutic abortion gives a better result than induced labor, but the indications are confined to a narrow sphere.

Hydrorrhea in Pregnancy, with Development of the Fetus Outside the Chorion. Wiemer[1] reports an interesting case of a multipara who during pregnancy had a discharge of more or less blood-tinged fluid with a slightly offensive odor, which was especially abundant at night. Labor pains did not develop, but the fluid continued to be discharged, and a diagnosis of hydrorrhea was made. After an especially profuse discharge labor developed and terminated spontaneously, the fetus being in breech presentation.

On examining the specimen the umbilical cord was exceedingly thin and the weight of the fetus but 2000 gm. The amniotic cavity was so small that it could not have contained the fetus, hence the child was developed largely outside of its usual location. The source of the hydrorrhea was the amnion, and the birth of a living child under these circumstances was the exception.

Holzapfel has collected 14 similar cases, in a few of which the child survived.

Cryoscopy of the Urine during Pregnancy. The application of this method of study of the urine is reported by Büttner.[2] The patient was a healthy primipara during the latter part of gestation, and the urine was examined by taking the freezing point and the quantity of chlorides contained, and the results were tabulated and graphically recorded. The total amount of soluble material excreted during pregnancy was below the average, and the deficiency lay in those substances produced by proteid metabolism. At the time when this excretion was lowest the weight of the pregnant woman increased most rapidly.

The Lymphatic Glands in Pregnancy. Meyer[3] examined 59 pregnant patients to determine the condition of the lymphatic glands. In one patient no glands could at any time be found by palpation. Examinations were made weekly during the period from two to twelve weeks

[1] Zentralblatt f. Gynäkologie, 1907, Nr. 23.

[2] Ibid., Nr. 26.

[3] Surgery, Gynecology, and Obstetrics, May, 1907.

before labor. The ages of the patients varied from 16 to 40; 30 of the cases were among whites, and 29 among negroes. Examinations were made at 9 o'clock in the morning, the patient being in bed with the clothing suitably arranged. All the accessible lymphatic glands were palpated.

In taking the histories, especial attention was given to tuberculosis, disease of the breasts, skin, teeth, and scalp, disease of the tonsils, and venereal disorders.

In 98.3 per cent. the axillary glands were palpable at one time; in the same percentage, the inguinal glands; while the submaxillary could be made out in 74.6 per cent. Fluctuation was present in 66.1 per cent. of the axillary glands, and in 62.7 per cent. of the inguinal glands; the submaxillary glands could be palpated at every examination in 44.2 per cent.; the other lymphatics of the body could be made out in much smaller percentages.

The axillary glands enlarged progressively in 25.4 per cent.; the inguinal in 15.2 per cent., while lactation caused swelling of the axillary glands in 62.5 per cent. In about one-quarter of the cases the inguinal glands grew smaller after labor.

There was only one case in which no gland in any part of the body could be palpated. The question naturally arises as to whether axillary glands enlarge by reason of lactation.

Pregnancy and the puerperal period in healthy patients caused no general enlargement of the lymphatics. When these glands increased in size it was the result of local causes. No new formation of lymphatics was observed during pregnancy, although the size of the glands on the two sides of the body varied considerably.

Epilepsy and the Status Epilepticus Complicating Pregnancy. Jardine[1] quotes Turner's statistics upon epilepsy complicated by pregnancy and parturition.

He found that in but 2 out of 41 cases, pregnancy was the original cause of epilepsy; it induced relapse in 14 out of 61, proved temporarily beneficial in 6 of the 41, and seemed to make no difference in one patient.

Epilepsy brought on labor in 5 of these cases, and caused relapse in 17; lactation caused epilepsy in 3, and relapse in 6. The total number of pregnancies was 61 in 41 individuals.

Jardine reports the case of a multipara who had been well during pregnancy until nearly term, when she had an eclamptic fit of the epileptic type. The patient was removed to the hospital, blood was taken from the arm, and intravenous saline transfusion performed. The patient was delivered, having free hemorrhage from a badly lacerated cervix. Convulsions occurred after delivery, and sedatives were given; finally lumbar puncture was performed followed by the injection of stovaine.

[1] Journal of Obstetrics and Gynecology of the British Empire, July, 1907.

After this the patient relapsed and required active stimulation. The fits became more frequent, and the patient passed into the epileptic state and died.

At autopsy minute hemorrhages were seen in the membranes of the brain; the liver, and spleen were congested and enlarged; the kidneys smaller than normal, and microscopic examination showed evidence of acute nephritis.

The child was still born, but the autopsy was negative.

It could not be observed that any method of treatment employed influenced the case.

Three other cases are reported in which the mother recovered.

Pregnancy and Rhythmic Chorea. Marshall[1] reports the case of a young woman pregnant two months, who after great excitement developed choreic-like movements, continuous throughout the night, and preventing sleep. The patient's limbs moved constantly as she lay upon her right side, with constant nodding movements of the head. The body was thrown slightly forward and the knees flexed upward. The contractions were so frequent that the patient had practically no relief from them.

The patient was completely isolated in a darkened room, given sedatives, and in five days the movements had ceased. Three weeks later there was a slight return which lasted but two days.

French and Hicks[2] draw attention to the importance of chorea in relation to *heart lesions and rheumatism* in the pregnant condition. The mortality in the series of cases was 10 per cent., the most unfavorable symptom being a rise of temperature above 102° F. The interruption of pregnancy is of little avail in these cases, and one cannot base a prognosis upon the frequency of the movements.

Martin[3] reports two interesting cases of recurrent chorea in pregnancy, and believes that when choreic movements complicate labor that tend to increase in severity, they indicate some serious condition, as endocarditis or meningitis.

Eclampsia. Among the many recent papers upon this subject that of Esch[4] is of especial interest. His material was obtained in Olshausen's clinic in Berlin, where in 6657 cases of labor, eclampsia occurred in 7.45 per cent. In the Leipsic clinic the frequency of eclampsia was but 2.07 per cent. Among these patients 78.3 per cent. were pregnant for the first time, and one-seventh of these were older than twenty-eight years. Eclampsia had previously occurred in 9; in one instance the mother had eclampsia three times in succession. There were three patients who had eclampsia early in pregnancy that recovered, and later,

[1] Journal of Obstetrics and Gynecology of the British Empire, April, 1907.

[2] Ibid., vol. i, p. 201. [3] Deutsche med. Wochenschrift, 1907, Nr. 31.

[4] Zeitschrift f. Geburtshülfe und Gynäkologie, 1906, Band lviii, Heft 1.

at the time of confinement, eclampsia recurred. In 9 other patients pregnancy was not interrupted by eclampsia, the patient going to term.

Headache was the most significant symptom of threatened eclampsia. Gastric pain and vomiting preceded convulsions. Sight was destroyed in most cases. The usual aura of epilepsy was not present.

A review of the literature on the subject shows that eclampsia occurs after labor in percentages varying from 14 to 29, sometimes as late as two days. The longest interval between confinement and eclampsia was two months.

Among those cases admitted to the hospital with eclampsia, the conditions most frequently observed were the comatose state, difficult breathing, quick pulse of high tension, occasionally irregular and small. The patients, as a rule, were exceedingly restless, and with consciousness more or less obscured. A moderate rise of temperature was frequently observed.

In the greater number of cases in some part of the body edema was present. In a considerable number serum albumin was present in the urine, and the specific gravity was from 1010 to 1018, highly colored, sometimes brownish red or dark. There was decreased secretion of urine, but immediately after labor the quantity was larger and the albumin less. In most cases debris from the kidneys was found.

The convulsions were epileptiform, lasting from three-quarters of a minute to twenty-two minutes. The number of convulsions varied greatly, one patient having 146, 65 of which were on the fourth day after confinement. In 49 per cent. of cases, emptying of the uterus was followed by the cessation of convulsions; in 77.6 per cent. some obstetric operation was performed, and in 21 of these patients the cervix was not dilated when operation was commenced.

The mortality in 496 patients was 21.4 per cent., being highest in March and November. Autopsy was obtained in 70, and septic infection was found in 4—evidently not depending upon the operation performed.

Bossi's dilator was employed in 31 cases, of whom 14 died, and among whom there were 12 autopsies. The cervix was not lacerated in 8, in 3 on one side only, and in one very extensively; one of these cases died of septic infection. The longest period occupied in dilatation was sixty minutes, but it could not be demonstrated that the length of time employed in dilatation influenced the mortality directly. When eclampsia occurred in the puerperal period the mortality was 15.4 per cent.; if convulsions did not begin until after fourteen hours had passed, following labor, there was no mortality.

The unfavorable symptoms were a great number of convulsions and high temperature. The quantity of albumin found had no bearing whatever upon the severity of the case. On the contrary, abundant casts indicated a very unfavorable prognosis, as also did a highly discolored condition of the urine.

It is impossible to give an exact prognosis. When the pulse is good, the patient breathing easily, and not deeply unconscious, the case is favorable. If birth-pressure or manipulation excite convulsions, this is also favorable. Deep coma, a small and rapid pulse, and rising temperature are most grave. The more speedily these symptoms develop the more dangerous is the condition. Among other symptoms, icterus, hemoglobinuria, suppression of urine, and scanty secretion were unfavorable. The longer the cases have been in convulsions and the greater the exhaustion, the more dangerous the condition. The greater the age of the patient and the number of casts, the more unfavorable the prognosis. When the emptying of the uterus is followed by improvement the outlook is good, especially if headache disappears after confinement. In the puerperal period the most dangerous complications are pneumonia arising from inspiration, or a bronchopneumonia.

Where as many as 15 convulsions occur, the child is usually lost. If narcotics are freely given to the mother the child requires active stimulation to establish respiration. The fetal mortality after eclampsia was 22.7 per cent., which is less than that stated by others. These children are liable to convulsions, and should be guarded from irritation or excitement.

The results in these cases are favorable for rapid delivery, although not invariably successful. The use of Bossi's dilator in place of vaginal Cesarean section raised the mortality 4.5 per cent. When the cervix was extensively incised and delivery followed, the mortality was 28.9 per cent.; under the use of Bossi's dilator 27.87 per cent.; and when vaginal Cesarean section was performed, the operative mortality was 19.8 per cent. The decision to empty the uterus must be made with reference to each individual patient.

In medicinal treatment the bromides, opium, and chloral are used as indicated, and the patient should be anesthetized for all manipulation. If the condition of the heart demands it, stimulants may be used. Diuretics and a milk diet should follow delivery, and during delivery it is well to give ergot hypodermically.

Care should be taken that the patient is disturbed as little as possible; the room should be darkened, the foot of the bed raised, and the patient's head turned to one side to permit the escape of secretions. The mouth should frequently be wiped with gauze. No effort was made to cause perspiration, as such efforts were thought to be injurious; whereas if the patient were very plethoric, bleeding was practised, followed by an injection of salt solution. Most valuable is the strict regulation of the diet during pregnancy.

An unusual postmortem finding in eclampsia is reported by Reisch.[1] The patient was delivered by forceps, dying shortly afterward. Upon

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 2.

section, *cystic degeneration of the liver and kidneys* was present, being especially abundant in the liver.

Partridge[1] reports 37 cases of *puerperal eclampsia* among 883 births; among these there was one case of twins. The mortality was 33.3 per cent.

The Thyroid Gland in Eclampsia. An interesting condition of the thyroid gland in eclampsia is described by Potte and Kervally.[2] The patient died with eclampsia; at autopsy the renal lesions were inconsiderable and the liver apparently was not much altered. The thyroid gland, however, was greatly enlarged, colored a yellowish brown, with a number of vesicles upon its surface, and apparently a colloid goitre.

Microscopic examination showed the acini very small, the glandular cells showing fatty degeneration, and considerable colloid material was present. The connective tissue was greatly altered, and the gland showed degeneration and proliferation, cystic dilatation, and the presence of colloid material.

Eclampsia with Increased Kidney Tension. Braak and Mijmleff[3] report a case of eclampsia which recovered under medicinal treatment.

On examination the right kidney was found greatly enlarged and painful on palpation. The left kidney could not be plainly outlined. The quantity of urine was greatly diminished, and was reddish in color, containing 6 per cent. of albumin, red blood cells, casts, and epithelium.

The patient recovered after delivery.

Eclampsia without Convulsions. This anomalous condition is described by Schlutuss.[4] The patient was a primipara who came into labor with strong pains, and amniotic liquid of a greenish color. The patient had no convulsions, although she vomited frequently, and complained of oppression in the head and chest. Labor was spontaneous. There were very slight twitching motions of some of the muscles, but the remainder were in absolute rest. The patient was comatose for some time, the urine containing 3 per cent. of albumin, bile, and casts.

This condition gradually improved until the patient made a good recovery. The child was greatly jaundiced but recovered.

Eclampsia and Nephritis. Scheill[5] reports the case of a patient who had repeated eclamptic convulsions in each of three pregnancies. One kidney had previously been removed for tuberculosis. Labor was induced at eight months, followed by eclampsia and the disappearance of abnormal conditions in the urine. In three pregnancies but one product of conception survived, and that was after the induction of labor

[1] American Journal of Obstetrics, August, 1907.
[2] L'Obstétrique, July, 1907.
[3] Zentralblatt f. Gynäkologie, 1907, Nr. 42.
[4] Ibid, Nr. 4.
[5] Journal of Obstetrics and Gynecology of the British Empire, June, 1907.

at eight months in the second pregnancy. After the birth of the infant, and when symptoms of kidney failure in the third pregnancy were observed, it seemed best to make further impregnation impossible, and accordingly the Fallopian tubes were resected.

Placental Ferment as a Cause of Eclampsia. Haufbauer,[1] in an extensive review of the toxemia of pregnancy, draws attention to the part played by placental ferment circulating in the mother's blood in the production of eclampsia. He believes that this has something to do with the altered glycogenic function of the liver in these cases, and calls attention to the lesions so commonly found in the liver in all eclamptics. This he believes to result largely from the deposit in the liver of placental ferment.

Toxemia of Pregnancy Complicated by Prolonged High Temperature. Jardine[2] reports the case of a primigravida six months advanced, who had grippe followed by pneumonia and jaundice. There was slight dulness at the bases of the lungs, the liver was enlarged, and there was a soft systolic murmur at the base of the heart; there was bile in the urine. The temperature was 101° F.; pulse, 130; hemoglobin, 52 per cent.; red corpuscles, 4,500,000; whites, 10,500. The patient had a severe chill on one occasion, and there was some tenderness over the gall-bladder. Tubercle bacilli were not found in the urine or sputum. The Widal test was repeated several times, with negative results.

On admission the patient was jaundiced, emaciated, the tongue covered with a hard brown crust, with slight bleeding from the gums. Fetal heart sounds could be heard, and the pregnancy was six and a half months advanced. The urine was deeply stained with bile. The patient became much exhausted, and was delivered with forceps. The amniotic liquid and membranes were also deeply stained with bile. The patient recovered, the jaundice gradually disappearing.

I have recently had under observation a primipara about seven months advanced, who was sent to the hospital for pernicious nausea. She had just recovered from la grippe, and for a week had been able to retain no food in the stomach. There was no jaundice, the pulse was rapid and weak, the temperature ranging from 100 to 102° F. After the patient had had moderate doses of calomel, followed by salines, she was able to retain peptonized milk. There was cough, and the sputum when examined contained no tubercle bacilli, but abundant diplococci. The abdomen was not distended, but the pulse was rapid and weak, the second sounds being especially so. The Widal test was negative, the blood showed anemia, and careful physical examination showed impaired resonance over the chest, without fluid. The liver was not enlarged; the tongue was furred and coated very heavily.

[1] Zeitschrift f. Geburtshülfe und Gynäkologie, 1907, Band lxi, Heft 2.

[2] Journal of Obstetrics and Gynecology of the British Empire, January, 1908.

The patient was apathetic, and took food with reluctance. The urine was interesting in its nitrogen partition; the urea was lessened and ammonia nitrogen greatly increased, reaching as high as 29 per cent. The creatin and rest nitrogen were also increased.

The patient was treated by peptonized milk and irrigation of the intestine, followed by the absorption of salt solution, complete rest, and brandy and digitalis.

The toxemic condition gradually cleared, when the temperature fell to normal.

The Importance of Hospital Treatment in Morbid Pregnancy. Ballantyne[1] urges the importance of medical treatment during pregnancy in the interests of mother and child. He cites cases treated in the Royal Maternity Hospital, at Edinburgh, of polyhydramnios with vomiting, and pernicious nausea, which were especially treated under his care in the hospital. While the results in some of these cases were not satisfactory, sufficient was accomplished to urge the importance of the method.

In 3 cases of eclampsia subsequently treated the results were very much better. He also reports albuminuria complicating pregnancy and other conditions, whose successful treatment cannot be properly carried out in the ordinary house.

A Plea for Prompt Delivery in Eclampsia is made by Strempel,[2] who reports a case of very severe eclampsia recovering after the uterus was emptied. The first convulsion followed the rupture of the membranes, and delivery was speedily accomplished by incision of the cervix followed by the application of forceps. Severe convulsions with cyanosis developed, and the patient's respirations became so feeble as to require artificial breathing. Her symptoms very gradually abated, and she finally recovered from the eclampsia, the puerperal period occupying eight weeks. Severe mental disturbance complicated recovery.

The number of eclamptic convulsions is considered an indication of its severity.

Englemann[3] reports the case of a primipara who had 200 convulsions in eclampsia. She was treated by venesection, hot baths, injections of camphor, and scopolamine. In spite of the unfavorable condition of the patient, she ultimately recovered.

The Treatment of Eclampsia with Parathyroidin. Licorrilli publishes in the *Annals* of the Academy of Medicine, Torino, his results from the administration of Bassale's parathyroidin in eclampsia.

Seven pregnant patients were treated in doses ranging from 100 to 180 drops; one of these patients was in the seventh month of pregnancy with eclampsia; four had kidneys greatly congested; and one had chronic nephritis. Where congestion of the kidneys seemed a prominent symp-

[1] British Medical Journal, January 11, 1908.

[2] Zentralblatt f. Gynäkologie, 1907, Nr. 43.

[3] Ibid., Nr. 11.

tom the patients were greatly improved, eclampsia was prevented, albuminuria diminished, arterial tension lessened, and edema and other minor symptoms disappeared. In the patient who had eclampsia the convulsions ceased, the albuminuria diminished, diuresis became established, and pregnancy was prolonged forty days. In the cases having chronic nephritis, parathyroidin had no effect and it was necessary to interrupt the pregnancy.

Three of the children were stillborn and macerated, the placenta showing abundant infarction.

Eclampsia Treated by Decapsulation of the Kidneys. This procedure, so warmly advocated by Edebohls, was practised by Falgowski.[1] The patient was a multipara who had a rapid easy labor, followed nine hours afterward by headache, and thirteen hours after confinement by eclamptic convulsions. Fifteen severe seizures occurred, the patient was in a comatose condition, the urine highly albuminous and containing blood, traces of sugar, granular casts, and leukocytes. The patient continued in coma, and, as other treatment was unavailing, decapsulation of both kidneys was performed. The patient recovered.

Decapsulation of the kidneys also finds an advocate in Gauss, from the clinic in Freiberg.[2] He describes an obstinate case, in which labor was terminated by the use of forceps. Eclamptic convulsions continued in a severe degree, and among other methods of treatment lumbar anesthesia with stovaine was employed. Decapsulation of the kidneys was performed, but eclamptic convulsions continued, the patient making a prolonged and tedious recovery.

His second case was that of a primipara aged eighteen years, who also had decapsulation, after which the convulsions continued. The patient was delivered by vaginal section, which did not cause the cessation of the convulsions. The patient ultimately recovered, with gradually increasing secretion of urine.

The specific gravity of the urine after the first attack was 1023, rising just before operation to 1034, then gradually falling to normal, the quantity of albumin varying from 18 per cent. before decapsulation to 24.36 per cent.; when following operation to 15 per cent.

By cryoscopy corresponding changes were also observed. The urine contained red blood cells, and casts, which increased in quantity until the fourth day after the patient's delivery, when these substances gradually disappeared from the urine.

Sippel[3] urges the value of decapsulation of the kidneys in eclampsia. He would employ this method when the interruption of pregnancy and medicinal treatment had failed to relieve the patient. He has found a very marked improvement in the congestion and vasomotor tension

[1] Zentralblatt f. Gynäkologie, 1908, Nr. 2. [2] Ibid., Nr. 19.

[3] Münchener med. Wochenschrift, No. 44, p. 2173, and Berliner med. Wochenschr., No. 49, p. 1559.

which formed so prominent a symptom in these patients. He believes that the severance of the capsule secures the reëstablishment of the circulation almost immediately.

A similar observation was made by Polano,[1] who employed the method in the case of puerperal eclampsia. The patient's anuria was lessened, but she did not recover.

Ectopic Gestation. The extensive literature of this subject has been enriched by a considerable number of interesting papers.[2] Sazbo reports 5 cases of ectopic gestation going to a considerable period of fetal development, and treated by operation.

In the first case a tumor as large as a man's head, weighing 2800 gm., was removed from the right side of the pelvis, and a small uterus, Fallopian tube, and ovary, had been pushed over toward the left. The right tube and ovary were situated externally and beneath the tumor. The operator was able to make a pedicle for the tumor, which was ligated in three portions with silk, and the tumor was removed. It contained a fetus in what might be termed a breech presentation. In the fetal sac was a small quantity of thick reddish-brown fluid, and a thin, poorly developed placenta could be made out. The pregnancy had been in the right cornu of a rudimentary or practically bicornate uterus.

The second case was that of a patient aged thirty-two years, who had ceased to menstruate for a year. She had an abdominal pregnancy which came to false labor, the midwife being in attendance, and fetal movements gradually ceasing. The patient had difficulty in respiration, with general malaise, and was brought to the hospital for treatment. An abdominal tumor could be demonstrated, and the patient showed signs and symptoms of pregnancy. There was a purulent discharge from the vagina. The patient had some fever, a furred and coated tongue, loss of appetite, and a frequent pulse, indicating absorption from the decomposing contents of the fetal sac.

Upon section a necrotic tumor was found adherent to the surrounding tissues, and finally removed. Considerable hemorrhage followed from a pseudomembrane which had formed about the tumor. This was controlled by ligature and pressure. Hemorrhage also occurred from the posterior surface of the uterus in the right broad ligament. The tube and ovary on the right side were normal. The pedicle of the tumor came from the left tube, which was readily ligated. After operation the patient's temperature fell very considerably and she seemed threatened with collapse. The patient made a tedious recovery.

On examining the tumor removed, it weighed twelve pounds and contained 1.5 litres of fluid. It also contained a placenta with membranes and fetus 41 cm. long, with corresponding development.

[1] Zentralblatt f. Gynäkologie, No. 1, p. 14.

[2] Archiv f. Gynäkologie, 1907, Band lxxxii

The third patient had had two previous labors without complication. She was intensely anemic, complaining of pain in the head and abdomen, with occasional vomiting. There was some hemorrhage from the vagina, and the patient's condition was so bad that operation was postponed until she had improved. A month after coming under observation abdominal section was performed and an abdominal tumor found, which ruptured during manipulation. The tumor had unfolded the broad ligament. The fetal sac was 11 cm. long and 7 cm. wide, containing a fetus whose head measured 4 cm. in diameter. The mother made a good recovery.

The fourth patient was a multipara, markedly anemic, in whom an abdominal tumor could be recognized. There were symptoms of pregnancy, and as the patient's condition was poor, operation was performed. Upon opening the abdomen fetal parts became visible, the head lying upon the right side, covered with a thin membrane. The sac was considerably adherent and had ruptured. The patient recovered, her recovery being complicated by abdominal tenderness and a purulent discharge. The fetus was 20 cm. long.

The fifth case was also a multipara in very bad general condition, with impairment of the lungs, and an abdominal tumor reaching to the umbilicus. Upon operation, the tumor was separated from the omentum and contained a macerated fetus with a thick and semipurulent fluid. The fetal sac was connected with the right uterine cornu and Fallopian tube, and there were adhesions to the bladder. The tumor was removed by ligating its attachments, but the patient's condition was so desperate that she died shortly after operation. The placenta could not be recognized; infection and suppuration had evidently occurred in the fetal sac, and the absorption from this had brought about the depressed and fatal condition of the mother.

Iwasse[1] reports 38 cases of tubal pregnancy from the Gynecological Clinic in Tokio. These patients were all treated by abdominal section. In 8 cases the Mikulicz drain was used, and in one case drainage was secured through the vagina. The gauze tampon was used for drainage, and two died of peritonitis resulting from infection of the fetal sac. The mortality in the whole series was 15.7 per cent.; 3 of these patients died of peritonitis, 2 of acute anemia, 1 of anemia complicated with nephritis.

The study of these cases shows some essential difference in the appearance and course of ectopic gestation in Japan and in Europe. In Japan this condition was seen most frequently between the twenty-fifth and thirtieth years of life. Most of the cases—86.8 per cent.—were in multiparæ. Very frequently ectopic gestation was preceded by a period of sterility, and the condition often manifested itself after a premature birth or abortion. Iwasse thinks that operations performed to correct

[1] Archiv f. Gynäkologie, 1908, Band lxxxiv, Heft 2.

the position of the uterus, such as ventrofixation and operations upon the round ligaments, must have something to do with the production of ectopic gestation. Pregnancy was usually interrupted in the early months—during the first and second frequently through abortion; in the third and fourth, more often through rupture of the Fallopian tube. Abortion is more frequent than rupture. Where ectopic gestation goes to term the fetus is more liable to malformations and anomalous positions than in normal pregnancy. Bleeding from the uterus and abdominal pain are symptoms which appear immediately after ectopic gestation begins, or which follow each other with a brief interval between. Migration of the impregnated ovum is very rarely observed.

Scheffzek[1] reports 5 cases of ectopic gestation, the first of which ended fatally after the removal of an abdominal tumor which extended from the pelvis as high as the border of the ribs. Fetal movements and heart sounds could not be recognized.

At operation the tumor was found to be as large as a man's head, with smooth external surface, grayish brown in color, and firm upon pressure. The introduction of a trocar was followed by no diminution in the size of the tumor. There were many adhesions between the surrounding tissues and the tumor. The uterus and appendages could not be distinguished. The adhesions were loosened, delivered from the abdomen, the pedicle formed was ligated, and the tumor removed. There was considerable hemorrhage, the patient dying several days after operation from peritonitis.

The second case was one of tubal pregnancy developing in the folds of the broad ligament, and treated by operation. The tumor was extirpated, its bed closed by a layer of sutures of catgut, and the patient recovered, although her convalescence was delayed by an exudate in the pelvis.

The third case had an abdominal tumor extending three fingers above the umbilicus, and with the consistence of a pregnant uterus. Fetal parts and heart sounds could not be distinguished.

On section, the tumor was turned out of the abdominal cavity and found to be developed from the right cornu of the uterus. Its pedicle was ligated and the tumor removed. The left Fallopian tube was normal. The patient made a good recovery. The tumor was as large as a man's head, weighing 2600 gm. It proved to be the right cornu of the uterus, containing a fetus weighing 1870 gm.

His fourth case died of peritonitis before operation, and autopsy showed a fetus in the abdominal cavity, with a placenta and membranes in the uterine cornu.

The fifth case was diagnosticated as a benign ovarian tumor, possibly a fibroma. At operation the tumor was apparently an interstitial myoma

[1] Archiv f. Gynäkologie, 1907, Band lxxxii, Heft 3.

of the right Fallopian tube at its junction of the body of the uterus. The tumor was removed and its pedicle securely closed.

On examining the specimen, it was found to be a uterine cornu, and in the centre a cavity which had contained a fetus.

Deferred Operation for Ruptured Ectopic Gestation. Simpson[1] reports the case of a patient with ectopic gestation, who had symptoms of rupture, and remained quiet for eleven days. Against her physician's directions, she walked about a mile, and was seized with severe pain in the right side, and became suddenly anemic without external loss of blood. She was transferred to a hospital where she remained for twenty days—in all forty-one days after the first attack. Operation was then performed, and a quart of clotted blood and the tube and membranes of the pregnancy removed. The patient had had a tubal abortion. She made a good recovery.

A second case is reported where operation was done seventeen days after rupture of an ectopic gestation. The patient's condition when first seen was so serious that operation was declined. A tubal abortion was found, with three clots of different ages, indicating three distinct hemorrhages. These clots were encapsulated and contained about a quart of blood. The patient recovered.

The third case had four hemorrhages, with attacks of pain and more or less prostration. On examination under ether, a pelvic mass was found not larger than an English walnut, and suppuration was present at the umbilicus. At operation, blood clot was found of large size, and both Fallopian tubes were removed. The patient had had a right tubal abortion. She made an uninterrupted recovery.

His fourth case was a patient who became pulseless and apparently dying after rupture of an ectopic gestation. Twenty-three days after rupture the abdomen was opened, the blood clot removed, and a ruptured Fallopian tube also removed. In this case, the patient must have died had operation been performed immediately upon rupture.

Two other cases are reported in which a delay of from four to six weeks was practised before operation was performed. These patients made good recoveries.

The author believes that in desperate cases delay should be practised until the patient's condition justifies operation. Where unruptured ectopic gestation can be diagnosticated, operation should be immediately performed.

Windisch[2] reports 5 cases of ectopic gestation, one of which was complicated with pernicious nausea and vomiting.

Robb[3] has reported 20 cases of ectopic gestation, 11 of whom made good recoveries. In 9 of these the abdomen was opened, and in 2 the

[1] Surgery, Gynecology, and Obstetrics, November, 1907.
[2] Zentralblatt f. Gynäkologie, 1907, No. 45.
[3] American Journal of Obstetrics, July, 1907.

vagina. There was 1 death among the 20, in a patient who after operation for tubal rupture, did well until the tenth day, when ileus developed.

Robb has conducted experiments upon animals to determine the effect of hemorrhage following section of the pelvic bloodvessels, and the possibility of recovery from such severe hemorrhage without interference. He finds that even when all the vessels supplying the tubes, ovaries, and uterus were severed, the animal did not bleed to death, but gradually rallied.

This has a direct bearing upon the question of immediate operation for ruptured ectopic gestation. The strongest reason for such operation has been the belief that patients would die from hemorrhage, but, in view of clinical experience and Robb's experiments, we must believe that this danger is not so imminent as has been supposed, and that the safer way in cases of ruptured ectopic gestation with hemorrhage is to defer operation until the patient has rallied from the hemorrhage. Robb's experiments were most interesting, and constitute a valuable contribution upon a most important point in the management of ectopic gestation.

Heim and Lederer[1] contribute an extensive paper, with bibliography, upon the management of ruptured ectopic gestation with the free escape of blood into the abdominal cavity. In all, 27 operations were performed, 23 of the patients recovering and 4 dying. The mortality following such operations is given by Seidel as 14.4 per cent.; Runge, 26.4 per cent.; Zuntz, 20.3 per cent.; the mortality of this series of cases being 14.8 per cent.

These patients died of acute anemia, in one case complicated by pulmonary tuberculosis; in another, by wound of the bladder accompanied by peritonitis. In those patients that recovered, 8 had no fever, 7 subnormal temperature, and 8 immediately after operation had considerable fever. This was often accompanied by chills and hemoglobinuria, pointing to hemolysis. This seems to have resulted from the rapid absorption of a large mass of extravasated blood, producing autolysis. The average time of recovery of these patients was twenty-six days. Others report from thirty-six to twenty-four days.

As regards the permanent results, these could be traced in 22 cases; 2 had ventral hernia, 1 fistula, and 11 were entirely well and free from all disability. In 16 cases which were closely followed, there were 4 abdominal hernias following the use of the gauze tampon at the time of operation; in 16 cases an effort was made to determine whether or not conception occurred after operation; 2 patients had normal labors within two years after operation; one had abortion six months after, and one patient was three months pregnant, which showed that ectopic gestation does not make further conception impossible.

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Heft 1 and 2.

From recent literature of ectopic gestation, certain points seem fairly well established. The immediate danger of death from hemorrhage is not so great as we have supposed. In cases where the patient is severely shocked from sudden and copious bleeding it is better not to operate immediately, but to wait until the patient has reacted somewhat from the hemorrhage. If the blood is contained within the patient's body and some of its elements must be absorbed, the case is different from that of a correspondingly severe hemorrhage where the blood escapes externally. Robb's experiments and clinical observations justify this position.

Cases of unruptured ectopic gestation should be subjected to operation so soon as the diagnosis has been established. In dealing with abdominal pregnancies, unless the operator can control the site of attachment of the placenta by ligature, he will do well to leave the placenta, stitching the membranes to the abdominal wall and tamponing the fetal cavity.

Where ectopic gestation has resulted in death of the embryo with decomposition, or formation of pus, incision and drainage is the treatment indicated.

Sinclair[1] describes four cases of operation for early ectopic gestation. One of these was complicated with appendicitis, the patient having high temperature and tympanitic distention of the abdomen. The appendix was very much altered, and most of the patient's symptoms seemed to be caused by the condition of the appendix. One patient was subjected to two operations, ectopic gestation having been diagnosticated, but the first operation was abandoned because the patient collapsed upon the table. A few days afterward she had revived sufficiently to permit of operation, when the ectopic gestation and the vermiform appendix were removed. The appendix was firmly attached to the top of the fetal sac.

Mond[2] describes an interesting specimen of tubal gestation at the fourth month. The history was typical, and a diagnosis was made of ectopic gestation, the ovum having perished. At operation, a four months' fetus was found lying free in the abdominal cavity with the umbilical cord attached to the fetal sac connected with the right tube. The opening through which the fetus had escaped could plainly be made out. The tube had not ruptured spontaneously, but following erosion.

Repeated Ectopic Gestation. Phillips[3] reports the case of a patient who had a child eleven years old; eighteen months after this pregnancy she had a miscarriage. About ten years before coming under observation she had been operated upon for ectopic gestation. A sac

[1] Journal of Obstetrics and Gynecology of the British Empire, April, 1907.

[2] Zentralblatt f. Gynäkologie, 1907, No. 12.

[3] Journal of Obstetrics and Gynecology of the British Empire, January, 1907.

containing putrid blood was found at this operation, and the patient made a tedious recovery complicated with suppuration.

In the present instance there was a large gestation sac in Douglas' pouch, and the left tube was much thickened and attached to the apex of the sac. It was removed and the sac drained and the peritoneum closed. The patient made a good recovery, the uterus being small and its mobility somewhat lessened by adhesions.

Kuppenheim[1] reports 3 cases of repeated tubal gestation. The first patient was a multipara who had a tubal gestation of the left side, followed by operation, a tube being removed before rupture. When the patient next came under observation she complained of having had severe pain with a disturbance of menstruation. She was brought in in a condition of severe shock. Operation was immediately performed by opening the posterior vault of the vagina and extracting a mass of blood clot and a three months' fetus. The patient collapsed completely during operation, and died two hours afterward. The source of this pregnancy had been the right tube.

The second patient had also had a tubal gestation upon the left side, which was removed successfully. The second pregnancy occurred in the remaining tube, and was also successfully dealt with by abdominal section. The interval between the pregnancies was three years.

His third case was that of a patient who first was operated upon for hematocele following ruptured ectopic gestation. The patient was treated by a posterior colpotomy followed by the removal of blood clot and the application of a tampon. Four years after, she came under observation with pregnancy in the left tube. On section, the diagnosis was confirmed, the right tube and ovary being found completely adherent from the first gestation. The patient made a good recovery after the removal of the pregnant tube.

The frequency of repeated ectopic pregnancy is estimated by Harm at 1 in 54; Wertheim, 7 to 8 ruptured cases in 120; Küstner, 5 in 116; Dührssen, 2 in 37; Ryser, 4 in 50; Reiffersheid, 2 in 43; Orthmann, 2 in 45; Heikel, 4 in 80; Hörmann, 5 in 125.

The writer observed 3 repeated ectopic gestations in 45 cases.

Early Ectopic Gestation with Misleading Symptoms. Leicester[2] reports the case of a European woman who had a hard, irregular, rounded tumor just above Poupart's ligament upon the right side. The uterus was anteverted, pushed forward, and not enlarged. In Douglas' pouch there was a soft boggy mass, tender and of indefinite outline continuous with the mass felt through the abdominal wall. The patient had slight fever. This mass gradually softened until fluctuation could be detected.

[1] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 1.

[2] Journal of Obstetrics and Gynecology of the British Empire, September, 1907.

An incision was made though the vagina into the mass and a large quantity of blood and clot evacuated. The cavity was irrigated and a drainage tube inserted. A tumor the size of a hen's egg could be distinguished at the right side of the uterus. In a few hours the patient's temperature rose to 104° F., with severe pain in the right lower portion of the abdomen. Her temperature gradually fell to normal, and the mass at the right of the uterus grew smaller. The patient gradually recovered without operation.

The second case was that of a Eurasian, supposed to be pregnant three months, who had a chill and fever, vomiting, headache, rapid breathing, and pains throughout the entire body. On vaginal examination there was tenderness and resistance at the left of the uterus without distinct tumor. On the right side a definite fulness could be made out. On abdominal section the middle of the left tube was enlarged, and the appendix was found adherent to the cecum. The left tube and appendix were removed. The tube contained an early ectopic gestation, but the embryo could not be demonstrated.

LABOR AND ITS COMPLICATIONS.

Typhoid Infection was a complication of labor reported by Rosenfeld.[1] His patient was a primipara aged nineteen years, with the characteristic symptoms of typhoid when she came into labor. The expulsive forces gradually ceased before the head reached the pelvic floor, and the patient was in such a condition that it was thought unwise to make a high application of the forceps. Accordingly craniotomy was done and the child readily delivered. The patient seemed much better after delivery, the temperature falling, the pulse growing less frequent and stronger. Forty-eight hours afterward there was increased temperature, and examination showed a grayish deposit about the mouth of the uterus and vagina. The lochia was scanty and without offensive odor. Tincture of iodine was applied to the site of the membrane, and vaginal douches of formalin given. The patient's septic condition grew rapidly worse, and antistreptococcic serum was administered. The involution proceeded normally and there were no signs of peritonitis.

The diagnosis of typhoid had not been positively made previously, but the absence of typical symptoms and the failure of treatment, and a positive Widal reaction, established clearly the diagnosis of typhoid. The patient made a tedious recovery.

Labor Complicated by Cerebrospinal Meningitis. Williamson[2] reports the case of a girl aged thirteen years and nine months, who was seized with violent pains in the lower back and abdomen, with vomiting,

[1] Zentralblatt f. Gynäkologie, 1907, No. 17.

[2] British Medical Journal, November 9, 1907.

and who was suspected to be in labor. The patient and her mother declared that this was impossible.

On admission to the hospital the temperature was 101° F., pulse 100, full and bounding. The patient was slightly cyanosed and there was herpes about the nose and mouth; the tongue was furred but moist, the pupils reacted normally, but the patient had a peculiarly frightened appearance. Uterine contractions became almost continuous, the breathing exceedingly difficult, cyanosis increased, and the pulse was rapid and irregular. The patient was threatened with collapse, and was given strychnine hypodermically. The vertex was presenting high up, but there seemed to be some cause besides labor for the patient's serious condition. There was congestion at the bases of both lungs, but no valvular disease of the heart; there was edema and the patient was very sensitive to touch. Upon the lower abdomen and thighs there were some dark spots. These had developed within a short time after her admission to the hospital; they were dark in color, irregular in shape and size, some of them flat, and others were small blisters. On pressure the color did not disappear. The patient very quickly grew worse, and although she remained conscious, had great pain and difficulty in swallowing and very labored breathing. Death shortly occurred.

At autopsy the membranes of the brain were congested, the vessels full, and serous fluid was abundant in the cranial cavity. The brain substance was normal, but there was increased serous fluid and blood in the cerebral tissue. Throughout the lungs and in the pericardium serum was abundant and the lungs were also congested; the peritoneum was congested and covered with black spots of varying shapes and sizes; there was abundant serous fluid in the abdominal cavity.

The fetus seemed to be full term and apparently healthy. The placenta, membranes, and cord showed no lesions; the mesenteric glands were congested and the liver engorged with blood. The mucous membrane of the gall-bladder was covered with dark spots; the spleen, kidneys, suprarenal capsules, and pancreas were congested, and dark spots covered the mucous membrane of the stomach; the walls of the intestines were similarly spotted, and Peyer's patches were congested; the large intestine was congested and its walls also spotted; the mucous surface of the bladder showed a similar appearance.

A bacteriological examination was not made, but the lesions present were characteristic of cerebrospinal meningitis.

I also recall the case of a woman found during the winter, alone in a tenement house, shortly after delivery and in an unconscious condition. The face was dusky and spotted and there were spots upon the abdomen and other portions of the body. The patient's high fever, rapid and feeble pulse, and pronounced coma suggested cerebrospinal meningitis.

The fact that this disease was epidemic at the time in the locality from which the patient was taken seemed to confirm this diagnosis.

On further examination, however, I expressed a doubt as to this diagnosis, and declared the case one of virulent puerperal septic infection. At autopsy, and after bacteriological examination, this diagnosis was found to be correct. The patient had an overwhelming streptococcic infection with petechial eruption, and purpuric spots throughout the mucous membranes.

Labor after Vaginal Fixation of the Uterus. Haupt[1] has collected 35 cases of labor after vaginal fixation, of which 7 occurred in the clinic at Greifswald. At full term the fundus in these cases was unusually high in the abdomen; in 6 the vertex presented, in one a transverse position. The average period of dilatation was ten hours, and the average time of expulsion five hours, while the placenta was expelled on the average in three-quarters of an hour.

The case in which transverse position occurred was that of a multipara with relaxed uterine and abdominal walls; she had also a transverse position in the preceding labor.

The cause of this abnormality was thought to be the fixed position of the cervix and lower uterine segment following the operation. In 7 of these cases, on leaving the hospital, the position of the uterus was that of anteflexion. The results of 20 cases are combined with the foregoing, bringing the total up to 45, with premature labor in 2 per cent., and operative interference in 2.2 per cent.

That operations for the fixation of the uterus are liable to produce transverse position was exemplified by a case recently delivered under my own observation. The patient was a multipara, unable to give a concise history, but who had evidently had an abdominal section for fixation or suspension of the uterus. The child was in transverse position, the head lying high upon the right side and the breech upon the left. Although considerable dilatation was present, the uterine force was insufficient to rupture the membranes, and labor remained absolutely stationary. It was necessary to deliver the patient by version, and this was accomplished with considerable difficulty, as the child was brought down through what seemed to be a narrow and constricted portion of the uterus. The patient had no considerable hemorrhage after labor, but it was necessary to remove the after-birth.

Labor Complicated by Premature Rupture of the Membranes. Calliri[2] gives his conclusions based upon cases of premature rupture of the membranes observed in the clinic at Milan. He believes that the increased morbidity seen in these cases is not due so much to the premature rupture of the membranes as to some condition requiring opera-

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 5.

[2] Annali di Ostetricia, 1907, No. 2.

tive interference, and which brought about the premature escape of the amniotic liquid, such as abnormal contour in the pelvis or anomalous presentation.

He did not find that rupture of the membranes in itself complicated the puerperal period when the labor was spontaneous and conducted under antiseptic precautions. Labor with premature rupture of the membranes and no other complication was not especially prolonged.

Amaurosis Complicating Labor. Radtke[1] observed 4 cases of purely functional amaurosis complicating labor.

The first was a primipara who during pregnancy suffered from edema, vomiting, headache, but without disturbance of vision. Two days before labor ophthalmic examination was negative. Two hours after the beginning of pains vision became obscured, and in a few moments sight was lost. Twenty-two minutes after the first disturbance of vision a severe eclamptic convulsion occurred. The patient's sight was again considerably disturbed, and coma supervened. The patient was rapidly delivered, but vision did not become normal until the eleventh day of the puerperal period. There was considerable albuminuria.

In the second case disturbance of vision occurred suddenly, followed in half an hour by complete amaurosis with headache and vomiting. Eclampsia supervened, with the development of albuminuria and casts in the urine.

In the third case, three weeks before labor, amaurosis occurred with giddiness, although the eye grounds were perfectly normal. This condition lasted for three days and then disappeared. In this case also albuminuria developed, but speedily ceased.

In the fourth case there had been edema in the latter portion of pregnancy, and during the period of dilatation there was severe headache. An hour and a half after spontaneous labor specks suddenly developed before the eyes, with great impairment of vision; two and a half hours after labor the patient became completely blind. Reaction of the pupils was normal and the eye grounds were normal. The patient could distinguish light and darkness between two and three days afterward, and vision returned in four days. Psychic disturbance, which developed when vision failed, disappeared as sight returned. Ophthalmic examination was negative. There had been albuminuria, but this disappeared before the patient left the hospital.

Amaurosis developing suddenly in a pregnant patient must always excite suspicion of approaching eclampsia. If followed by severe frontal headache it is a most valuable warning.

Active Interference in Labor. Under this title Hofmeier[2] discusses the question so frequently raised as to the advantages, on the whole, of active interference, with reasonable indications, during labor.

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 2.

[2] Zeitschrift f. Geburtshülfe und Gynäkologie, 1907, Band lix, Heft 2.

In 9000 births during six years, 300 fetal deaths occurred in children developed from full term to the end of the eighth month. The statistics of other clinics show a much smaller mortality rate, in some instances reaching less than 3 per cent. Deducting those stillborn and about to die when the mother was admitted, 168 children in 9000 labors died during labor and because of some complication occurring in parturition.

These complications are divided into those pertaining to the bony canal of the mother, where pelvic contractions either alone or with some other complication, caused the death of the children, and those where no such complication was present.

In the first group occurred 42 per cent. of the cases; in the second group 58. Where birth was unduly prolonged the fetal mortality was 12 per cent.; in contracted pelves, 44 per cent. It is thought that the mortality from prolonged labor might have been lessened had the forceps been used more frequently, for among the 9000 births forceps were used in 2.34 per cent. In cases where placenta previa or prolapse of the cord was present the fetal mortality was naturally high. The use of the dilating bag and prompt extraction in these cases gave, as a rule, favorable results. In cases of contracted pelves it was not the pelvic contraction alone which caused fetal death, but in 18 cases the mothers' expulsive efforts were too weak to secure delivery.

When a critical study was made of cases of pelvic contraction it was found that the fetal mortality was 16.4 per cent. When these cases were treated by version, 20 children died; when the expectant method was pursued, 28 children perished; and when prophylactic version was performed a similar number were lost.

Hofmeier also calls attention to the high mortality rate after induced labor as a very serious objection to this operation. In comparing the results of other clinics where a more active interference is practised, he finds that better results were obtained; when, however, the use of forceps, Cesarean section, pubiotomy, and vaginal section in other clinics are compared, it does not seem that the adoption of this operation was of especial value. It is interesting to note the very great improvement in the results for the fetus obtained by Cesarean section and those operations which enlarge the pelvis. When the major obstetric operations are considered in treating Cesarean section, symphysiotomy, and pubiotomy, 26 out of 27 children left the hospital in good condition. Three of the mothers, or 11 per cent., died, one after each of these operations.

When the after-history of these children was investigated it was found that of 21 children delivered by Cesarean section, 3 could not be traced; 4 died during the first year; 14 survived. Of 3 children born by symphysiotomy, one died three days after operation, one during the first year, and one lived four years afterward. Of 3 children born by pubiotomy, 1 died during the first year, two survived. Of 24 children

whose history could be traced, 7 (or 29 per cent.) died in the first year of life.

While Hofmeier takes a conservative position regarding the ultimate value of interference in labor, he believes that the frequent use of the forceps under proper precautions is attended with good results. He would not increase the number of operations performed, but would improve their quality, and determine more carefully the indications for which they were done. He calls attention to the wide difference existing in the conditions pertaining in general practice and those in hospitals. He estimates that of the 2,025,847 children born during the year in Germany, 30 per cent. perished before the end of the first year, and asks how great an improvement in the final result would be obtained by increasing the frequency of obstetric operations? A critical and impartial analysis is necessary before a definite answer to this question can be given.

Difficult Labor from the Presence of a Monstrosity. Nacke and Benda[1] report a case of twin pregnancy in which after the expulsion of the first twin heart sounds could not be heard. Internal examination revealed a large soft mass presenting which could not be recognized. When the hand was introduced an opening was found, and it was supposed that a transverse position was present with some abnormality in the breech. On endeavoring to make version a foot could not be found. When under anesthesia a more careful examination was made, a tumor as large as a fetal head could be made out in the pelvic brim. This was gradually brought down and was found to be a greatly swollen thigh, both of which took as much room in the pelvis as the breech.

A diagnosis of acardiacus was made, and the operator attempted to extract the fetus by traction with a blunt hook. This failed, as did also an attempt to open the abdomen of the fetus in the hope of removing its viscera and lessening its bulk. After a tedious operation lasting one and a half hours, with a blunt hook and scissors the acardiacus was finally delivered. The chief difficulty in extraction lay in the enormously broad hips and swollen breech of the monstrosity.

Premature Separation of the Normally Situated Placenta. Herzfeld[2] reports the case of a premature separation of the normally attached placenta in a multiparous woman which terminated favorably by dilatation and version. So soon as the head of the child was born a large mass of clotted blood and fluid blood followed. Although the patient suffered from acute anemia, she rallied under stimulation and made a good recovery. No adequate cause for the complication could be found. The patient was seen first in apparently normal labor, and the writer left the house to return shortly after. He was hastily summoned, finding the patient in severe collapse, having expelled clotted blood. The sudden onset

[1] Zentralblatt f. Gynäkologie, 1907, No 17.

[2] Archiv f. Gynäkologie, 1907, Band lxxxii.

of the placental separation is the interesting and unusual point in the case.

Herzfeld reviews the subject at some length, and in the terminology of the condition draws attention to the fact that hemorrhage is apparent in but one-fifth of the cases, thus explaining the use of the word "concealed" by many writers.

The *cardinal symptoms* of this accident are those characteristic of hemorrhage. The patient frequently becomes faint suddenly, and in the writer's collection of 250 cases, in 88 severe collapse developed rapidly. More often the condition proceeds slowly and insidiously with the very gradual accumulation of clotted blood within the uterus. Autopsy shows that the membranes are often separated but very slightly from the uterine wall, which accounts for the retention of blood within the uterus. This was most frequent when the placenta was attached near the fundus. When the blood succeeds in separating the membranes it makes its way to the os and appears externally.

Very often the discharge is serum or blood-stained fluid, dark in color, and must be distinguished from the liquor amnii. It is rare to see bright pure blood discharged in these cases. In 29 cases where the placenta separated during labor 3 had hemorrhage, which was entirely within the uterus. The membranes remained unruptured until the birth of the child. In many cases external hemorrhage first occurs after the membranes have ruptured, while in other cases blood appears externally after the recession of the presenting part, which up to that time efficiently closed the cervix. It is very rare for blood to escape into the fetal sac. In most cases clotted blood within the uterus excites contractions. As the blood accumulates, the overdistended state of the uterus causes tonic contractions to cease, the womb remaining in a state of chronic hardness.

The patient usually complains of severe pain, which is described as if something in the abdomen had torn asunder or had dropped downward into the abdominal cavity. The pain is usually referred to the fundus because the placenta is most often attached at the upper portion of the uterus. The complaint of pain followed by gradual enlargement of the uterus, and the diminution of contractions is characteristic of the condition. The pain experienced may be sometimes like that of colic, although having very little influence upon the condition of the os and cervix.

The uterus is altered in form, distention, consistence, and sensitiveness. When these changes appear suddenly they indicate very considerable hemorrhage. The uterus is sometimes so greatly enlarged as to occasion dyspnea. Unless the suddenness of this change is noted the physician may be deceived in estimating the period of gestation. In one instance the uterus was so distended that Cesarean section was performed, when the womb was found filled with blood, and a fetus,

but three months developed, present. The uterus at seven months has reached the tip of the sternum and has been found to contain three quarts of clotted blood. It is sometimes possible to palpate this clotted blood at the fundus of the uterus above the fetus. The greater the uterine tension, the greater the sensitiveness and pain which the patient experiences when the uterus is palpated. The peritoneal covering of the womb is sometimes ruptured by this distention, and ecchymosis may develop. The conditions are unfavorable for palpation, and it is often impossible to accurately outline the child. As the fetus dies the fetal heart sounds cease, thus removing one element in diagnosis. When the condition develops very gradually fetal movements are occasionally felt. If the membranes are unruptured on vaginal examination they are felt to be distended and tense. Obstinate vomiting, vomiting of blood, and severe nose-bleed have been observed in these cases.

The differential diagnosis rests largely between placenta previa and rupture of the uterus and the condition under discussion. In placenta previa vaginal examination reveals the condition, while uterine rupture develops during labor in the presence of strong uterine contractions. The fetus escapes to a greater or less extent into the abdominal cavity.

In rupture of the uterus Tarnier draws attention to a depression in the uterine wall at the point of rupture. When ectopic gestation, or peritonitis following perforation, is present, palpation and percussion would recognize the condition.

The *frequency* of this complication has been variously estimated. In the Rotunda Hospital no case was recognized in 156,100 labors. Partial separation of small extent has been found seven times in 1000 labors; in 163,738 births there were observed 218 cases of accidental hemorrhage, and 261 of unavoidable; in 6455 labors there were observed 36 premature separations of the normal placenta, 9 of which were followed by serious consequences; in 17,200 labors there were observed 83 cases of premature separation. At the Paris Maternity there were 27 cases in 20,900 births; at Guy's Hospital, 31 cases in 23,591 births; at the Lying-in Hospital in New York there were 10,000 labors without a case; at the Sloane Maternity, 57 cases in 5900 labors. In 3024 cases of labor in private patients, Rihl observed 3 cases of this complication; in the entire collection of cases there were 489 in 259,456 labors—a frequency of 0.0018 of 1 per cent.

The difference in statistics is explained by the fact that some of the milder cases are not always recognized.

This condition results from any disease which brings about a degenerate condition of the endometrium. Direct mechanical violence is also responsible for some cases, such as violent uterine contractions or force externally applied. When the endometrium or decidua is diseased, and the uterus is roused to strong contractions, separation becomes

practically inevitable. In some cases, however, no anatomical condition is found in the lining membrane of the uterus.

Nephritis is one of the most common causes of such hemorrhage, the frequency of which it is difficult to estimate. In 250 cases the urine was examined in 59, and 48 of these patients were found to have nephritis. More than half of the patients were between the eighth and ninth month of pregnancy, and of 45 children born, 40 perished. Besides nephritis, *syphilis* and *polyhydramnios* are recognized as causing the condition. A mechanical cause—the shortness of the umbilical cord—produced a maternal mortality of 22.2 per cent., and a fetal mortality of 50 per cent. Very rarely a hemorrhagic diathesis is thought to be responsble for this complication. One-fifth of the cases collected could be traced to direct traumatism, either through some accident in which the body was struck or shaken violently, or some mental complication which produced sudden and great excitement. In one case which came to abdominal section ecchymosis was found in the abdominal wall, and at the corresponding point in the fundus of the uterus a similar condition.

The accident is much more frequent in multiparæ than in primiparæ, probably because the uterus is much more relaxed. As pregnancy proceeds the tendency to this complication increases, although during labor itself it is not very frequent. If the head has actually descended into the pelvis, leaving the uterus, the accident can scarcely occur; 61 per cent. of the patients were more than thirty years old. The most frequent presentation of the child was the vertex in 89.7 per cent.; next the breech; next an oblique position; and very rarely face presentation.

So far as prognosis is concerned, there has been a steady improvement. At present a mortality of 29 per cent. is given, which compares favorably with that previously stated as 50.9 per cent.; fetal mortality, however, remains from 82 to 79 per cent., whereas the former mortality of the children was stated as 94.4 per cent. When hemorrhage began during or just after the beginning of the expulsion of the placenta the mortality fell to 27.3 per cent.; but when the hemorrhage began some time before labor the mortality rose to 40.4 per cent. When separation begins during labor itself the mortality for the mother is greater than when hemorrhage gradually develops, or when bleeding becomes external.

Sudden and total separation is the most fatal accident, the mother dying rapidly of acute anemia. It has been possible, however, to save the life of the child ten minutes after the placenta completely separated. The death of the fetus has been observed when one-sixth of the placenta became separated, while in one case the child lived five weeks with two-fifths of the placenta detached, and was spontaneously born in good condition at the thirty-sixth week of gestation. Others have observed the birth of a living child when one-fourth or even one-third of the placenta had become detached.

The *pathology* of the condition is largely that of vascular changes in the decidua and placenta. Ecchymoses in the superficial surface of the uterus were also observed, while changes produced in the decidua by the gonococcus have been assigned as a cause. Deportation of the villi of the chorion producing rupture of bloodvessels has caused the accident; fatty degeneration of the placenta, infarction in the placenta, echinococcus, and calcareous degeneration have also been observed.

As regards *treatment*, the choice naturally lies between the expectant method and some operative interference. Delay, so long as the hemorrhage is not excessive and labor develops, naturally gives the mother the better chance, but is unfavorable for the child. In 38 cases ending in spontaneous labor 91 per cent. of the mothers survived, while 81 per cent. of the children perished.

In 30 cases in which the cervix dilated completely and the membranes were artificially ruptured, all of the mothers lived, but 64 per cent. of the children perished.

When the vagina and cervix were firmly tamponed in 21 cases, 76 per cent. of the mothers survived, but 85 per cent. of the children died.

Premature rupture of the membranes is a disputed method of treatment and not universally accepted. In 34 cases 61 per cent. of the mothers perished. It is obviously best to retain the membranes until dilatation is advanced sufficiently far to permit the operator to empty the uterus promptly.

The use of Bossi's dilator has been followed by good results when the instrument was used for moderate dilatation only. Some operators, however, advise against its use. Deep incisions of the cervix and dilatation by bags have been employed by some with varying results. When dilatation and version were practised the maternal mortality was 49 per cent. and the fetal mortality 87 per cent. With the use of forceps the maternal mortality was 53 per cent. and the fetal mortality 89 per cent. When craniotomy was performed the maternal mortality was 50 per cent. When the Porro operation was employed, in 4 cases there was no maternal mortality, but all of the children perished. Cesarean section has been practised both upon the living and upon the dead in the presence of this complication. Its success depends in the living upon the resisting power of the mother; and where the operation is done to save the life of the child, upon the promptness with which it is carried out. In 250 cases 14 women died undelivered; in 5 of these the membranes were unruptured, and in 3 cases they had ruptured prematurely. The tampon had been employed in 6 of these cases; 3 of these patients had eclampsia. In 6 at autopsy the placenta was found totally detached and the uterus filled with blood. In a large proportion of cases the placenta was expelled spontaneously soon after the birth of the child. In other cases it was expressed by Credé's method or delivered manually. In some the placenta on expulsion was found to have been subjected to

considerable pressure within the uterus, which reduced its thickness more than one-half. The amount of blood lost in the uterus has been estimated at six pounds, four pounds, and three quarts.

Postpartum hemorrhage frequently follows this complication, in 32 per cent. resulting fatally. The tampon in the uterus is not always successful, and in one case vaginal hysterectomy failed. Adrenalin has given good results. Upon the first symptom of hemorrhage or separation the patient must be put at absolute rest; salt solution and stimulants have been useful; while ergot has been of little value.

Bossi's Dilator in the Treatment of Placenta Previa.—Guasoni[1] reports three cases of placenta previa in which Bossi's dilator was employed.

In the first case dilatation was carried to 7 cm. in five minutes; in the second case to 8 cm. in eight minutes; and in the third case to 8 cm. in seven minutes.

The mothers recovered with the loss of the children.

I would caution those who attempt to use Bossi's dilator in placenta previa that serious laceration may readily result. In my own experience, a living, full-term child was successfully delivered in central placenta previa after considerable dilatation with Bossi's dilator. An extensive laceration of the cervix accompanied by fatal hemorrhage resulted.

The dangers of *rupture of the uterus* in placenta previa are further illustrated by Winter.[2] After combined version in the last month of pregnancy, a weight of four pounds was attached to the foot of the child. Three hours later spontaneous expulsion occurred. Arterial bleeding followed which proved fatal, although the blood loss was not more than 1500 grams.

At autopsy a tear in the uterus extending to the contraction ring and into the subvaginal tissue was found. In another case of version and extraction, serious laceration occasioned violent hemorrhage, which was fortunately controlled. In one instance five minutes' time was occupied in bringing the head very cautiously through the cervix and extracting the child. In spite of the delay, laceration and fatal hemorrhage followed. In another case, after version the child was expelled largely by abdominal pressure followed by severe laceration of the uterus, and hemorrhage which required suture.

The safest method for the mother consists in combined version followed by the use of the child's body as a plug or tampon. The fetus is free from germs, and the portion of its body retained exerts pressure upon the placenta. If traction be made, the head of the child becomes extended, and in its descent serious laceration may occur.

In reviewing 100 cases treated by combined version, the mortality of ten mothers was recorded. In five of these, 1 died of pneumonia, 1 of rupture of the uterus before version was performed, and 3 perished

[1] Zentralblatt f. Gynäkologie, 1907, No. 5.

[2] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 5.

of hemorrhage because of delay in operation. Three patients died of septic infection, which is ascribed to the use of gauze tampons. In two cases only could a fatal result be fairly ascribed to the combined version. While this method of treatment is favorable for the mother, 87 per cent. of the children perished.

The objection to the use of iodoform gauze tampons in placenta previa is the liability of infection, the condition of the tissues and the presence of clotted blood being especially favorable for this accident. The tampon is rarely necessary, for the cervix is usually dilatable sufficient to introduce two fingers. Should this not be the case, it should be cautiously dilated to this extent by instruments. If an elastic bag can be introduced, especially when the placenta is pierced, and the bag carried through the placenta, the maternal mortality is 50 per cent. There is here great danger of infection, not only because the bag may not be sterile, but because bacteria from the vagina are carried in with the bag. Except in hospital practice it is difficult to introduce a bag through the placenta. Rupture of the uterus has also been observed.

The Treatment of Placenta Previa in General Practice. Füth[1] has collected statistics of placenta previa in general practice from 540 midwives in the vicinity of Koblanz; 726 cases were collected, and among these there were 137 spontaneous births, 484 accomplished by version, 42 by extraction, 23 by forceps, and 1 by craniotomy. In some cases elastic bags were used, and in 3 rupture of the membranes was sufficient; 12 women died undelivered, and in 24 cases the method of delivery was not reported. In all, the mortality rate was 19.7 per cent.; 12 patients died before labor, 9 during labor, 122 after labor. Hemorrhage caused the death of 98 mothers, infection of 31, embolism of 6, uterine rupture of 2; 1 died of typhoid, and 5 from causes unknown

In 168 cases labor pains developed soon after the first hemorrhage, and in these the mortality was 11.8 per cent.; in 96 of these the tampon was employed; of 6 not tamponed, a smaller number died than of those treated by that method. In the majority of cases a varying interval existed between the first hemorrhage and the emptying of the uterus. In these patients the mortality was 22.6 per cent.; among these the mortality rate of those treated by the use of the tampon was considerably less than among those in whom the tampon was employed. Of the children the mortality was less than 50 per cent.

In a considerable number of these cases, 51 out of 726, the aid of a physician could not be obtained in time to assist the mother essentially, and the mortality rate among these was 31 per cent. It is estimated that when combined version was employed by a competent physician the maternal mortality was 20 per cent. The writer gives a report of 17 cases.

[1] Zentralblatt f. Gynäkologie, 1907, No. 12.

The Treatment of Postpartum Hemorrhage. Stowe[1] would treat postpartum hemorrhage by introducing one hand within the vagina and grasping firmly the cervix with the thumb and finger. With the other hand above the pubes the uterus is pressed deeply downward against the internal hand and compressed from before backward.

The method is illustrated, and should prove of value. Other methods of treatment are reviewed by the writer.

Aortic Pressure in Postpartum Hemorrhage. Henry[2] succeeded in checking a very severe postpartum hemorrhage by pressure on the abdominal aorta. The patient was turned upon her back and pressure maintained for half an hour, when the uterus began to contract; in one hour it was firm and hard. Ergot was given by the mouth.

In a recent case of marginal placenta previa with considerable separation, I compressed the abdominal aorta at its bifurcation by the following method: The patient was brought by ambulance to the Jefferson Maternity with the history of having bled intermittently for several days. A few moments after her arrival she became pulseless at the wrist. She was immediately placed across the bed, while an assistant administered ether sufficient to enable me to introduce the hand. The cervix was hastily dilated and a dead child at about seven months drawn cautiously downward and extracted, when the placenta and blood clots rapidly followed. The hand was then introduced into the uterus and folded as broadly as possible; the knuckles were carried above the brim of the pelvis, making pressure upon the aorta at its bifurcation, while the external hand made counterpressure upon the uterus. This was maintained for between ten and fifteen minutes, with the complete checking of uterine hemorrhage.

An assistant meanwhile opened a vein in the arm and introduced salt solution. Strychnine and ergot were given hypodermically. A long glass douche tube was passed into the uterus beneath the internal hand, and a hot uterine douche of 1 per cent. lysol was given. The uterus gradually contracted and was then firmly packed with gauze. Hemorrhage was thus completely controlled.

The patient rallied and survived a secondary shock with hemorrhage which developed about two hours later.

Face Presentation. Thorn's Method of Treating Face Presentation. Pushing up the head and substituting flexion for extension by combined manipulation is recommended by Thies.[3] Expectant treatment, reported by Boer and Zeller gave a mortality for the mother of $\frac{1}{2}$ per cent., and for the child of from 5 to 17 per cent.

[1] Surgery, Gynecology, and Obstetrics, June, 1907.

[2] British Medical Journal, June 8, 1907.

[3] Zentralblatt f. Gynäkologie, 1907, No. 28.

These results naturally suggest the desirability of changing the presentation, if possible, to the vertex.

In Zweifel's clinic, in Leipsic, and in out-patient service, 24 cases of face presentation were observed, and in 10 per cent. the presentation was corrected. The weight of the child was in only one instance less than 3000 gms. In one-half of the cases, or 12, the pelvis was flat rachitic or simple flat; in 9 the pelvis was normal, and in 3 the pelvis was not measured. These cases were treated by Thorn's method.

The internal hand made pressure upon the vertex or face, while the external hand pressed upon the shoulders, while an assistant made counterpressure upon the breech of the child; in 19 out of the 24 it was possible to change the face into a vertex presentation; in 5 cases the method was unsuccessful. Among these, one child weighed 4000 gm. and delivery was accomplished by craniotomy; in 2 cases the head was high in the pelvis; while in 2 the head was at the interspinous line, which is considered by Thorn an unfavorable position; in 3 of these cases there were contracted pelves. The percentage of failures was 17.

Among the successful cases the head was in the interspinous line seven times, in 12 the head was above this line, and in 6 above the small pelvis. After correcting the position of the head spontaneous expulsion followed in from one-half to one hour. The mortality among the children was 12 per cent. No maternal mortality was given.

Thies cautions not to adopt this method when uterine rupture is threatened or when placenta previa, prolapse of the cord or of the arm is present. It is not thought that a contracted pelvis is a contraindication, but rather an indication.

The prognosis for the child is unfavorable in contracted pelves, and should be better with vertex presentation.

Thies would adopt this method with the hope that it would be followed by spontaneous birth. If this were not the case, the forceps should be used. This method is thought better than prophylactic version. In cases where the membranes have ruptured prematurely, an elastic bag should be inserted in order to preserve as much of the amniotic liquid as possible.

High Forceps in Face Presentation. Jolly[1] reports two cases of face presentation in which he made high application with the forceps. The Nägele forceps was employed in the first instance and applied in the transverse diameter of the pelvis, the left blade over the occiput, the right over the chin. With strong traction the head was brought into the pelvis and the forceps so rotated that the chin was brought anterior. The forceps was then removed and again applied in the right

[1] Zentralblatt f. Gynäkologie, 1907, No. 50.

oblique diameter over the ears of the child, and the head delivered with the chin in front. Complete laceration of the perineum in the first case occurred, which was immediately closed by suture. The child died a few days after birth from injuries to the cranium by forceps. An autopsy could not be obtained. In the first instance the mother had fever followed by exudate in the pelvis, which discharged eight weeks after labor through the vagina. The opening was then enlarged and the cavity irrigated, when convalescence followed.

The second case was complicated by a moderately contracted pelvis, the head lodging in the entrance to the pelvis and failing to descend. The same forceps was applied in the left oblique diameter and the head brought down very slowly and with great difficulty. After repeated applications the chin was brought beneath the pubis, and the head delivered. An extensive laceration of the pelvic floor resulted, which immediately closed. The child perished during delivery from injury to the cranium. The mother made a good recovery.

On examining the cranium of the second child it was found that the coronal sutures had been greatly enlarged and the parietal bones separated from the frontal. The dura mater was separated from the bone and fracture of the cranial bones had also occurred.

Posterior Rotation of the Occiput and its Treatment. Hardie[1] describes and illustrates his method for treating posterior rotation of the occiput. If the position is ascertained at the commencement of labor, before the membranes have ruptured, he would perform rotation by external manipulation.

When the head has entered the brim, the membranes being entire, the patient should be placed under the most favorable circumstances for internal rotation. The patient should lie upon that side toward which the occiput is directed. No interference should be practised until labor has well advanced into the second stage. If the posterior fontanelle is low in the pelvis the occiput will probably turn in front. Should the anterior fontanelle be lowest, rotation of the occiput is much less likely to occur.

In interfering in these cases, the first endeavor should be to increase flexion. Having mapped out accurately the position of the head, the patient should be placed on that side toward which the occiput is directed. Flexion should be increased by pressing with the fingers against the forehead, directing the pressure upward and slightly backward and toward that side which it is desired to rotate the head. This manipulation should be practised between the pains, and the head kept in its altered position until the uterus contracts, while pressure is continued, during uterine contraction, upon the forehead, to prevent the return of the original position. If this does not succeed in half an hour, more active treatment should be instituted.

[1] Journal of Obstetrics and Gynecology of the British Empire, September, 1907.

In Hardie's opinion the forceps should not be used until rotation has been at least partially accomplished. When the patient is well in the second stage, but the head is not on the perineum and the occiput is turning behind, the patient is anesthetized and turned upon the left side. When the back is to the right and the occiput posterior, the right hand, with its back upward, is introduced; the fingers should pass along the upper surface of the head near the forehead, the thumb placed on the lower temple, and the head is grasped with the entire hand, flexed and rotated, so as to bring the occiput in front. When this has been accomplished, the operator's hand will be upon the left side of the patient with the palm up. The hand is not to be removed, but the lower blade of the forceps is introduced along the hand. The forceps' blade keeps the head in its altered position until the entire instrument can be introduced. The operator then proceeds to deliver the patient by forceps. In his experience, he has rotated the head by the hand through two-thirds of a circle, and this rotation has been increased by the forceps without damage to the child. If this be difficult, an effort may be made to rotate the body with the left hand at the same time. When the back of the child is to the left the operator may insert either the right or the left hand as he desires. If he chooses the right hand, it is passed along the inferior surface of the head, palm upward, turning under the pubis to the right side, and when rotation is finished the palmar surface of the hand points downward. The upper or right blade of the forceps is first applied. If the left hand is used for rotation, it is passed over the head, palm downward in front of the perineum to the left side of the mother, remaining with the palm upward, and along this hand the left blade of the forceps may be inserted. When the right hand is introduced it grasps the forehead principally, and passes under the pubis from left to right, the upper blade being first inserted, when the left head is employed the occiput is grasped, the hand passing over the perineum from right to left, and the lower blade of the forceps is first inserted.

When the head is on the pelvic floor, flexion and rotation are produced in the same manner, but without the introduction of the hand. The left can help the right hand by making pressure on the forehead. Hardie adds excellent illustrations describing his method.

Porter,[1] in cases where the occiput rotates posteriorly, would correct the abnormality with bimanual rotation.

When the patient is anesthetized she is placed upon her back with the hips at the edge of the bed. The legs are supported by assistants, and the operator sits directly opposite the patient. The cervix being completely dilated, the left hand is inserted within the vagina as completely as is necessary to reach the head. The palmar surface of the fingers presses against the right side of the occiput with outward rotation

[1] Journal of American Medical Association, 1907, No. 21.

of the hand and forearm. The ulnar border of the hand is toward the pubes, the thumb pointing downward to the patient's right.

The advantages of this position are that there is room on the left side of the pelvis to introduce the hand without pushing up the head or decreasing flexion. The twisting of the hand and forearm increases the operator's power.

The finger tips of the right hand are then carried firmly on the abdominal wall above the pubes until pressure is made with the left frontal region of the head. If the head is low down the fingers must be carried firmly inward closely behind the pubes. The head is then rotated by the two hands, the internal hand making direct pressure against the right side of the occiput, crowding it firmly against the right side of the pelvis. With the head between the two hands an effort is made to rotate the occiput in front, and this effort inevitably increases flexion. The external hand continues to make pressure downward on the left frontotemporal portion of the head. When the forehead moves backward toward the mother's left, pressure is directed more to the left side. Rotation is usually readily accomplished in this way.

To maintain the correct position, the forceps is applied without removing the internal hand. After rotation has been accomplished an assistant should place the hand directly over the obstetrician's on the abdominal wall, to continue the pressure which this hand is making. The external hand is then removed and the operator proceeds to apply the forceps. With competent assistance the occiput rarely turns behind at this time.

Should the head turn posteriorly at the time when the hands are removed, and just before the forceps are applied, rotation should again be attempted, carrying the occiput but little beyond the transverse position.

When the occiput is upon the left side and behind, the right hand is used internally and the left externally. The head is rotated to the left side in front. The left blade of the forceps is then first applied.

The Diagnosis of Shoulder Presentation.—Kock[1] draws attention to the method of diagnosticating the shoulder which is presenting, that is found most useful. When the fetal hand is prolapsed, if this be placed in extreme supination with the thumb directed as far as possible toward the back of the hand, the thumb will point toward that side of the mother on which the head of the child is situated, while the back of the fetal hand corresponds to the back of the child. If then the back of the hand is directed anteriorly, the back of the child is in front; if the back of the hand is posterior, the back of the child is also posterior; if the thumb points toward the right side of the mother, the head is upon the right side, and if it points to the left, the head is also upon the left.

[1] Zentralblatt f. Gynäkologie, 1907, No. 52.

Narcosis during Labor.—Roith[1] makes a thorough review of narcosis by inhalation during labor.

In an extensive collection of cases 783 physicians reported 98,539 cases of inhalation narcosis, and 11,692 of local anesthesia. The advantages of local anesthesia are thought to be the lessening of the direct danger of the anesthetic, and the avoidance of disagreeable after-effects, such as those produced by chloroform upon the heart, liver, and kidneys.

Pneumonia following operations, which was formerly ascribed to the narcosis employed, is now considered due to the anesthetic. In 1007 cases of narcosis by inhalation for abdominal section and other operations, the mortality from pneumonia was 3.4 per cent., the morbidity 7.5 per cent. In 273 operations performed by local anesthesia, the mortality from pneumonia was 4.8 per cent., the morbidity 12.8 per cent.

In comparing chloroform and ether, chloroform is not so dangerous as it is sometimes thought to be. In 87,530 chloroform narcoses there were 54 fatalities, or 1 in 1683.

A critical analysis of these cases shows that in but 4 could chloroform be justly blamed for the result. The dangers of narcosis by inhalation through chloroform may be reduced by limiting its use as far as possible, by recognizing contraindications, such as heart lesions and septic infection, and by careful technique in administration, discarding complicated apparatus. For most purposes, however, ether is safer than chloroform.

The use of a preliminary injection of morphine, gr. $\frac{1}{8}$ an hour before operation, followed by the inhalation of ether, has given good results. The amount of anesthetic required being distinctly lessened, the inhalation can be suspended without losing control of the patient, should threatening symptoms arise.

In Estes[1] study of 21,000 cases anesthetized, some of them with ether, others with chloroform or with mixtures, it was found advantageous in a great number to begin with the use of laughing gas. Unfavorable symptoms were seen six times—more frequently with chloroform and its mixtures than with ether. Complications were more frequent in winter than in summer, and more commonly seen among men than women.

Inhalation anesthesia is least dangerous between the ages of ten and fifteen years. After this time complications increase. In 36 cases anesthetized during the first month of life, 3 had dangerous symptoms The use of ether is most dangerous between the sixth and seventh year.

The occurrence of complications depends very considerably on pre-existing emphysema, shock, alcoholism, heart lesions, bronchitis, anemia, and emaciation. A febrile condition, or a pronounced tuberculous infection, renders the case especially unfavorable for anesthesia.

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxvi, Heft 1.

The time necessary for anesthesia by chloroform is, on the average, seventy-two minutes and seven seconds; for ether, seventy-six minutes and nine seconds. It is recognized that the prolongation of anesthesia has a direct bearing upon the occurrence of complications. The very active secretion of mucus is more common under ether, and less frequent under chloroform. Complications in the vascular system were five times as frequent under chloroform as under ether. Bronchitis was observed after the use of ether once in 400 cases, and after the use of chloroform but once in 3300 cases.

It is interesting to observe that in these cases partial anesthesia was more dangerous and complete.

Tahradniky, in 33,109 anesthesias, had one death in 2264. When the results of ether were studied, there was one death in 1217.

The writer also quotes extensive statistics of 9289 ether inhalations without a death, and 5000 chloroform inhalations with but one death.

Lotheisen could find but one death among 8500 anesthesias with ethyl chloride. Lucke has collected 22 deaths from ethyl chloride, and estimates the mortality following the use of this substance as one in 16,000.

Attention has been called to the danger in the beginning of anesthesia by inhalation. In common with previous experience, it is found that mixtures of anesthetics are more dangerous than when but one pure substance is employed. In acute infectious diseases attacking the heart and in conditions of great general prostration, chloroform is especially dangerous, but in diseases of the heart and vessels alone, it is not more dangerous than other anesthetics. In these cases, chloroform may be given in small and increasing quantities. It is thought that in diseased kidneys chloroform is contraindicated.

The tendency in Germany is to use ether more than formerly, while France employs chloroform, and England and America ether.

For bronchial irritation following the use of ether, preparations of turpentine may be administered.

Where chloroform was given mixed with oxygen, arterial tension was diminished. Changes in the viscera were less, but hemorrhage was often more severe; and if anesthesia had to be repeated the danger was greater. When ether and oxygen were given, blood tension was increased, the disturbance throughout the organism was less, and changes in the viscera were less, while especial alterations in the fatty tissues were very much diminished. It is thought that a mixture of ether and oxygen would be especially valuable. Contrary to what is often believed, the function of the kidneys seems lessened by the use of chloroform.

In 600 cases of nervous and mental disease, observation showed that chloroform was the better anesthetic. Where it is desired to anesthetize young children, a combination of chloroform with laughing gas should be used to begin the anesthesia, followed by the substitution of ether.

The practice of administering morphine before anesthesia is condemned by Lawers, who found two fatal cases from this method.

The combination of carbonic acid gas with an anesthetic is especially dangerous.

As regards the fatal results sometimes seen after the use of chloroform, Heinz, Offergeld, Müller, Bessly, Guthrie, Thompson, Pringle, and Mansell observed that when chloroform was followed by a fatal result that death is prolonged for five days or more after the narcosis. Changes in the kidneys are seen, with degeneration in the cells of the connective tissue of the body, in the heart muscle, fatty degeneration of the liver, necrosis of the epithelia, and isolation of the cells. The heart and liver are affected sooner than the kidneys. The lesions in the kidneys are not always sufficiently severe to produce albuminuria. If fatty changes have already been present in the liver, they are much increased by narcosis, independently of the variety of anesthetic employed. Probably chloroform, bromide, and chloride of ethyl are more irritating than ether. The influence of the latter is least upon the heart and brain, unless repeated narcosis is instituted. In prolonged anesthesia with ether, small areas of pneumonia are observed with the accumulation of mucus in the alveoli of the lungs, with extravasation of blood corpuscles, and cell infiltration in the surrounding connective tissue. When chloroform is used these lung changes are less. Under ether the liver and kidneys are not so much affected as under chloroform. Under all anesthetics the changes seem to be essentially the same, but differing in degree with the duration of the anesthetic and the agent employed. The practical conclusion from these observations is that anesthesia should be made as brief as possible, and should not be repeated in from three to six days. Fatty degeneration in the heart, kidneys, and liver is a contraindication to anesthesia. Chloroform is less dangerous when diluted, while mixtures containing ether are no better than ether alone.

In children between the ages of four and twelve years, acetone was found in the urine after operation. The symptoms of acid intoxication are especially apt to develop if an acute infection has been present at the time of anesthesia. This danger is lessened if the liver and kidneys are performing their functions normally. In fatal cases of acetone poisoning the symptoms are delirium, coma, and uncontrollable vomiting, which becomes bloody. These symptoms do not follow the use of ether. The symptoms of chloroform intoxication often resemble those of phosphorus poisoning.

The treatment of this condition consists in the administration of sodium bicarbonate by the mouth, by the bowel, or subcutaneously, with the use of strychnine and caffeine hypodermically.

Both ether and chloroform greatly lessen the quantity of urine excreted during anesthesia. The more prolonged the anesthesia the greater the interference with the secretion of urine. After the patient

recovers from the anesthesia, the quantity of urine for the first three hours is often above the normal. The elimination of chlorides is increased, and during prolonged anesthesia, leukocytes and albumin appear in the urine.

When ether is given, Röhricht observed glycosuria in 87 per cent. of the cases.

A point of considerable practical interest in the use of anesthetics consists in those measures employed to prevent accidents following anesthesia. The disinfection of the mouth and pharynx by antiseptic solutions before anesthesia will assist in preventing inspiration pneumonia. Witzel and others have had excellent results by giving 15 drops each of tincture of strophanthus and tincture of digitalis, four times daily, before anesthesia. In cases where heart lesions are pronounced the effects of the anesthetic are sometimes less dangerous if moderate doses of morphine are given before anesthesia.

Kreuter, Strauch, and Dünnwald have had good results by giving veronal on the evening before operation. A moderate dose of morphine dissolved in alcohol and diluted, and given by rectum, sometimes lessens the amount of ether required.

In cases of failure of the heart action during narcosis, direct massage of the heart, either through the laparotomy wound, or by manipulation of the diaphragm, has been tried in some cases with success. The use of electricity and the injection of adernalin have also been successful. Camphor has given good results, and occasionally tracheotomy and artificial inflation of the lungs have been valuable.

So far as pneumonia after operation is concerned, it is claimed that the use of scopolamine-morphine has lessened the frequency of this complication.

In some cases the influence of anesthetics upon the blood seems especially unfavorable in the production of extensive changes in the corpuscles.

In the after-treatment of patients who have had anesthetics the use of salt solution is especially favorable.

In choosing between local and general anesthesia, the former should be selected for brief and unimportant operations. Even exploratory incision, gastrostomy, simple extraction of ovarian cysts, ventral fixation, plastic operations, and those which do not open the peritoneal cavity may be conducted under local anesthesia. Scopolamine-morphine injected into the membranes of the cord is unnecessary in vigorous persons with sound nerves. Where patients are fairly well it may be used to lessen the danger of pneumonia. Operations of considerable severity can be performed by a combination of local anesthesia with injections of scopolamine-morphine. For prolonged anesthesia and in general, ether is of especial value. In septic cases general and lumbar anesthesia is especially dangerous, and, if possible, should be avoided.

The individual peculiarities of patients should never be forgotten, as one sometimes sees cases which are exceptions to all rules.

An especially interesting bibliography accompanies this very thorough review of the subject, which we have analyzed as briefly as possible.

Gauss[1] has observed 500 cases in which narcosis was induced by *scopolamine-hydrobromide* and small doses of morphine. For from three-quarters to three hours the drug acted efficiently. Where the first injection failed, a second much smaller dose was administered which produced its effect in about half an hour; if this were not enough, this second dose was repeated. No unfavorable effects were observed, while the duration of labor was greatly shortened. The placenta was normally separated.

Among the children 23.8 per cent. breathed sluggishly after birth. When the quantity of morphine given was lessened, but 10 per cent. of the children showed a tendency to dyspnea; in 18 out of 65 children born asphyxiated no adequate cause was given for this condition.

Hocheisen[2] observed this method in 100 cases. He used this method only when the head became impacted and the cervix was considerably dilated and almost obliterated. In 24 per cent. the contractions of the abdominal wall were very greatly lessened. In 34 patients out of a total of 60 the expulsive period was distinctly longer. The uterus showed a tendency to relaxation and hemorrhage, and the placental period of labor was abnormal. Involution was delayed and there was a very decidedly unfavorable influence exerted upon the child.

Lehmann[3] in 70 cases found two injections of scopolamine and morphine usually necessary in each case. In ten minutes after the first injection the pains of labor grew less, and in 61.6 per cent. parturition was rendered painless; in 37 per cent. labor was prolonged; and 1.4 per cent. no influence whatever could be observed. The statistics as regards the children agree with those of other observers.

Klein[4] draws attention to the fact that in view of the dangers of anesthesia by inhalation, the method of anesthesia by spinal injection is appropriate in selected cases. In anemic, cachectic, and fat patients, *spinal injection of morphine-scopolamine* is especially indicated. Operations upon the vagina, perineum, and vulva, and abdominal section may be carried out with spinal anesthesia. Brief operations, such as curetting and exploratory incision, may be performed under temporary anesthesia with morphine-scopolamine. When considerable manipulation of the uterus and tubes is to be practised, the combined method is advisable, and in some cases it may be necessary to give a small quantity of chloroform or ether.

[1] Archiv f. Gynäkologie, Band lxxviii, p. 559.
[2] Münchener med. Wochenschr., No. 37 and 38.
[3] Zeitschrift f. Geburtshülfe und Gynäkologie, Band lviii, p. 297.
[4] Zentralblatt f. Gynäkologie, 1907, No. 27.

Version and Bringing Down of the Arm followed by Air Embolism during Labor. Apfelstedt[1] reports the very interesting case of a multipara with normal pelvis whose labor was complicated by an unusual position of the head. Face presentation developed and progress ceased as dilatation did not advance. The physician in attendance made two incisions into the cervix to hasten labor. When the patient was placed back in her bed after this manipulation, hemorrhage followed with sudden collapse. The head was high in the pelvis and movable, and the discharge of dark blood, partially clotted, continued. As the patient's condition was desperate, the hand was introduced to perform version, when the placenta was found low down in the uterus. The hand prolapsed and a foot was grasped, the child turned and brought down. Its extraction was comparatively easy, but was accompanied by the free discharge of dark blood. The patient speedily collapsed and perished.

An autopsy could not be obtained, but the symptoms were those following the entrance of air into the uterine sinuses.

The Use of Forceps. Riemann[2] states the results of the high application of forceps, with proper precautions, to be as follows: maternal mortality, 0; puerperal period complicated by fever, 16 per cent.; severe lacerations, 7 per cent.; mortality of the children, 10 per cent.

These results are sufficiently instructive to lead us to conclude that the high application of the forceps is justifiable, especially in moderately contracted pelves. It is, however, a procedure sufficiently grave to be avoided except for positive indications. The best results were obtained when mother and child were in good condition and the head was thoroughly moulded and engaged. In pelves whose true conjugate is from 8 to $8\frac{3}{4}$ cm., it is possible to deliver vigorous children alive in primiparous women; in multiparæ the conjugate should be from 9 to 10.5 cm.

In the clinic at Basle, in 10,913 cases of labor the forceps was applied in 3.27 per cent. of cases. Among these 78.3 per cent. were primiparæ. The instrument was never applied to the after-coming head, the usual indication being danger to the mother, then danger to the child, then danger to both. The indication for the forceps most frequently present was failure in the expulsive efforts which threatened exhaustion. The mortality for the mothers was 0.97 of 1 per cent., from fatty heart, eclampsia, and rupture of the uterus. In 8 cases there was severe infection, and mild infection in 36 per cent. The fetal mortality was 10.5 per cent. from intracranial hemorrhage, and in a considerable number of cases there was decided laceration.

The use of forceps in contracted pelves to save the life of the child is

[1] Zentralblatt f. Gynäkologie, 1907, No. 23.

[2] Ibid., No. 31.

considered by Leisenwitz[1]. His observations were made in the clinic at Dresden, and give material of interest.

In comparing the results of *hebotomy* with the use of forceps, the writer finds that after hebotomy 92 per cent. of the children were born living; after the use of forceps, in cases which might have required hebotomy, 67.57 per cent. of the children survived.

In 27,238 labors, the forceps was applied under the observation of the writer in 2.55 per cent. of cases. The frequency of forceps' application varies in different clinics, and in accordance with the views held by different obstetricians. In 63.13 per cent. the forceps was applied to rescue the children from the dangers of birth pressure; in 14.2 per cent. forceps' operations were made in the mothers' interests alone, and in 22.67 per cent. in the interests of mother and child. When the fetal heart sound dropped to 80 or 100, or rose above 160, with or without the escape of meconium, or prolapse of one of the smaller fetal parts, the forceps was used in the interests of the child. When mother and child were in danger the indication was exhaustion in the mother, with signs of interference with fetal circulation; fever in the mother, with beginning asphyxia in the child. Where the mothers' interests alone were concerned, eclampsia, nephritis, heart lesions, phthisis, and threatened failure of pains, the formation of a contraction ring rapidly increasing, premature rupture of the membranes, and hemorrhage all furnished indications. In the majority of cases, however, the forceps was used in the interests of the child. A comparison with the results of other clinics in Germany, Switzerland, and Bohemia shows that the use of forceps in the interests of the child is universal, but that usage differs as regards the application of the instrument for the mother alone.

In cases in which the operation was done in the interests of the child, it was performed in symmetrically contracted pelves in 66.5 per cent.; in normal pelves, in 78.9 per cent; in flat pelves, in 60.2 per cent.; in flat rachitic pelves, in 65.6 per cent.; and in uniformly contracted and rachitic pelves in 50 per cent. In contracted pelves the operation was most frequent in justo-minor or symmetrically contracted cases.

The explanation for this fact is found in the circumstance that in these pelves the passage of the child through the pelvis tends to increase asphyxia which may have begun at the beginning of labor. The high percentage of forceps' application in normal pelves arises from the frequency of prolapse or presentation of the umbilical cord, the large size of the child, and in cases where labor in these pelves has been unduly prolonged.

As regards the relative situation of the head in these forceps' operations it was found in the pelvic cavity in 50.21 per cent., in the entrance to the pelvis or upper brim in 5.31 per cent., and in the outlet of the pelvis in

[1] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 3.

44.5 per cent. Of the latter, the most frequent applications occurred in normal pelves; next in frequency, the justo-minor; while the flat and flat rachitic pelves were practically of equal frequency.

It is especially interesting to note the high application of the forceps, which in the interests of the child was comparatively rarely undertaken —5.31 per cent. This happened in 25 per cent. of highly contracted pelves, 6.98 per cent. of justo-minor pelves, while in normal pelves the forceps was never applied to the head at the pelvic brim. In cases where the pelvis was not contracted the relative large size of the child sometimes furnished an indication. The majority of these patients were primiparæ, 79.5 per cent., the multiparæ being 20.94 per cent.

In estimating the results of this operation, the mortality of the mothers was 3.01 per cent. This embraces all causes, including eclampsia. If the mortality is estimated in only those cases where mechanical complications alone were present, it is reduced to 0.58 of 1 per cent.

The mortality for the children was 15.63 per cent., embracing fracture and compression in 4.73 per cent., asphyxia, sometimes fatal during labor, in 6.59 per cent., and death from other causes developing soon after birth in 4.3 per cent.

When cases of fetal death which could not be fairly ascribed to the use of the forceps are eliminated, it is found that 89.32 per cent. of the children survived the operation, while the mortality is thus reduced to 10.68 per cent.

Where the forceps was used in the interests of both mother and child, and a correct mortality is computed, it is found to be 13.93 per cent.

When the maternal cases are carefully analyzed and only those studied in whom the forceps was applied in the interests of the children only, the fetal mortality was 11.54 per cent.; from asphyxia only, it is reckoned that but 6.35 per cent. of the children perished.

An analysis shows that the high application of the forceps is especially dangerous for the child in contracted pelvis. In such cases other operations should be elected. The operator will then have his choice of induced labor, hebotomy, or Cesarean section.

Practically similar results are obtained in the study of those cases where the forceps was applied with the head in the pelvic cavity.

In cases of normal pelves the fetal mortality by the use of forceps reached the high percentage of 14.28 per cent. In some of these cases the child was excessive in size; in others labor was complicated by prolapse of the umbilical cord and brow presentation. In 5.95 per cent. faulty technique in the operation itself was the cause.

In cases of contraction at the pelvic outlet the mortality rate for the child was 8.5 per cent.

As regards the injuries to mother and child both, if those lesions be considered which required suture, it is found that 73.6 per cent. of the mothers were injured. Such lacerations were those of the cervix, pelvic

floor, perineum, bowel, episiotomy wounds, and in one case vesico-vaginal fistula.

When injuries to the child alone are reckoned, aside from fractures, it is found that 5.45 per cent. had paralysis of the facial nerve and 1.15 per cent. had paralysis of a nerve plexus.

The tendency of this minute and interesting study is to show that especially in contracted pelves the use of the forceps is an operation of very considerable severity, and that although the forceps is most frequently used in private practice, the operation should only be performed when the indications have been thoroughly established.

The tendency of the argument set forth by the writer is to urge the performance of hebotomy rather than the use of the forceps in these cases.

The high application of the forceps is also studied by Riemann.[1] His paper contains interesting statistics from the clinic at Breslau, which illustrate the severity of the operation. The importance of securing sufficient dilatation of the cervix is emphasized. Complications developed in the puerperal state in 19 per cent. of these cases. Among the children the collected mortality was 31 per cent. This was especially influenced by the lack of configuration of the head by the pelvis in cases where uterine contractions were especially deficient. Where the head was well moulded the mortality of the children was 11 per cent.; but where moulding was absent it rose to 36 per cent. The mortality of induced labor for the child was 28 per cent., with a maternal mortality of 0. When symphysiotomy was employed the maternal mortality ranged from 4 to 6.5 per cent.; the fetal mortality 19 per cent.; when pubiotomy was the operation of choice the maternal mortality was from 5 to 7 per cent.; the fetal mortality 17 per cent.

In general, the high application of the forceps was followed by no maternal mortality which could be directly assigned to the operation. The puerperal period was complicated by fever in 16 per cent. of the mothers, and 7 per cent. sustained lacerations; 22 per cent. of the children perished; and 10 per cent. had injuries of a severe nature.

Comparing this result with those obtained in the clinics at Berlin, St. Petersburg, and Budapest, the maternal mortality ranges from 0 to 6.5 per cent. in high forceps, and the fetal mortality from 30 to 20 per cent.

The best results with high forceps are obtained when the child is vigorous and the head well moulded, and when the indication for the operation comes from the mother. In primiparæ successful results are often seen in pelves whose true conjugate varies from 8 to 8¾ cm.; in multiparæ from 9 to 10.5 cm. As pelvic contraction increases the results obtained by the use of forceps are much less satisfactory.

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 4.

Severe Laceration following the High Application of the Forceps. Puppel[1] reports the interesting case of a very large multipara, in whom three previous labors had terminated spontaneously. In the fourth the head failed to descend and remained above the inlet of the pelvis. As the child's heart sounds grew weak, an attempt was made to perform version, but this attempt was abandoned. The forceps was applied in the transverse diameter of the pelvis with the patient in Walcher's position. With strong pressure above the pubes, and vigorous contraction, the child was delivered in thirty minutes.

The cord was about the neck and the child was asphyxiated, but revived. The mother had no laceration of the cervix or perineum, and the placenta was readily delivered. After delivery the urine became bloody, the patient had pain on the right side above Poupart's ligament, with dulness on percussion, which grew worse, and she ultimately collapsed. She was at once taken to the hospital, and under anesthesia an incision was made over the right Poupart's ligament. Very offensive urine escaped from the incision, with particles of gangrenous tissue. The aperture extended to the base of the bladder in front and posteriorly to the posterior spine of the pelvis. Death followed shortly after operation.

Although a complete autopsy could not be obtained, sufficient was done to demonstrate lacerations of the bladder and surrounding tissue, which had been followed by ulceration. This laceration did not seem to be so much in the bladder wall as in the tissue outside the bladder, which had evidently been against the sides of the pelvis. Both ureters could not be found in the dissection. The injury evidently occurred during the excessively difficult delivery, and was probably made possible by the fact that the patient was in Walcher's position.

This very instructive case drawsattention to the condition of thebladder during prolonged labor. There was abundant evidence that in these cases the trigone of the bladder becomes intensely congested through the pressure of the presenting part before interference is practised. In cases of difficult extraction, pressure upon the perivesical tissues may become so extreme as to occasion narcosis and gangrene.

Another point of importance in this connection is the fact that somewhat similar injuries have been observed after difficult delivery following symphysiotomy or pubiotomy. While Walcher's position and opening the pelvic girdle increase the size of the pelvis, none of these operations can be absolutely relied upon to provide free exit for the head. When intrapelvic delivery is contrasted with abdominal delivery, the mechanical and insuperable difficulties of the former must be kept in mind, while the absence of such complications in the latter forms a strong argument for delivery by abdominal section.

[1] Monatsschrift f. Geburtshulfe und Gynäkologie, 1907, Band xxv, Heft 4.

Craniotomy.—Gushee[1] reports the craniotomies done in 1500 cases of labor in the service of the Lying-in Hospital. One-half the total number were in the out-door service, the remainder from the out-patient department.

The operation was done 122 times, or once in 123 labors. The operation was done four times as frequently in the hospital as in the houses of patients. This is accounted for by the fact that many emergency cases are brought into the hospital in a condition requiring craniotomy, and which had not previously been under observation. Many cases are referred to hospitals by physicians or midwives who had exhausted other methods of delivery.

The percentage of craniotomies is small in this series, especially among hospital cases. In the 122 operations, in 77 cases the fetus was dead before operation; and there were 11 cases of hydrocephalus, with a total of 88 operations performed from necessity. In 12 cases premature children were firmly held in the grasp of the undilated cervix—a condition which may sometimes be treated by Dührssen's method of cervical incision.

Among the cases under complete observation at the Hospital there were four maternal deaths: one from sepsis, one from eclampsia, one from rupture of the uterus, and one from diabetes. Of the 56 cases sent into the hospital by physicians and midwives, 11 terminated in death—in 6 from shock and hemorrhage, 3 from eclampsia, and the remaining 2 from septic infection. Among the cases treated in the out-patient department there were 2 deaths from septic infection.

There were 53 cases of contracted pelves, making craniotomy necessary, and in 29 patients the operation was done because the lower uterine segment was so overdistended that uterine rupture was threatened. Among these were 12 cases of premature labor.

Cesarean section is constantly replacing craniotomy in cases where the patient comes under observation sufficiently early to permit of a thorough study of the case and the choice of the method of delivery.

In the Dresden clinic Meissner[2] reports 57 craniotomies upon the living, and 112 upon the dead fetus, during a period of fourteen and a half years, among 29,725 labors. The frequency of operation was four upon the living child in 2123 cases of labor, and eight upon the dead child.

In the cases where the child was living there were 49 contracted pelves and 8 normal pelves. Of these mothers, 36 were primiparæ and 21 multiparæ. These cases varied in presentation of the fetus and the degree of dilatation of the os and cervix. The patients upon admission varied in the complications which they presented, some having

[1] Bulletin of the Lying-in Hospital of the City of New York, June, 1907.
[2] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 3.

eclampsia, others nephritis, septic infection, hematoma of the labium, and exhaustion. The operation was done under anesthesia in all but 6 cases. The cranioclast and large scissors were the instruments employed.

It is interesting to note the indications which were considered sufficient to justify the performance of craniotomy upon the living fetus. In 7 cases there were monstrosities; in 6 eclampsia; in 3 highly distorted pelves, in which the mother was in no condition to permit section; 8 had had some operation attempted outside the hospital; 3 mothers had some serious disease which made section impossible; and 10 patients had infection from attempted operation, which forbade section, but in recent years might have suggested the performance of pubiotomy.

The children varied in weight and in the degree of malformation present in some. Among these mothers the puerperal period was complicated by fever in 44 per cent.; 2 of the mothers died, one from eclampsia, the other from rupture of the uterus.

If the rule is to be followed that the mother's interests are first to be considered, and then those of the child, it is evident that, in large clinics at least, a considerable number of cases must be admitted in which craniotomy upon the living child becomes necessary.

There were 122 cases in which the child was already dead, and among these, contracted pelvis was present in 95.5 per cent. These cases showed various complications on the side of the fetus as well as the mother which made the operation clearly indicated in place of pubiotomy or section. Among these 112 cases, 7 died, 3 from eclampsia, one of caries of the vertebra, one under anesthesia, one of severe nephritis, and one from streptococcus infection. The total mortality of the clinic in cases where the children had died, or were in a dying condition, for the mothers was 1.2 per cent.

The most important factor in preventing the necessity of craniotomy upon the living child is found in prompt delivery. Pubiotomy or Cesarean section, in cases where the diagnosis of serious complications threatening labor has been made, should in a large percentage of cases prevent fetal death and the necessity for craniotomy.

Pubiotomy. The literature of this operation increases rapidly, and space permits us to give as far as possible the results only.

Kannegeiser[1] reports 30 cases of subcutaneous hebotomy in the Dresden clinic, and quotes extensively from previous literature, showing a maternal mortality ranging from 3.42 per cent., 5.94 per cent., 2.5 per cent., 10 per cent., and 4.2 per cent. The fetal mortality taken from the previous literature he estimates at 19 per cent. for symphysiotomy and 47 per cent. for induced labor. In his cases he estimates a maternal mortality of nil. Morbidity ranging from 6 to 7 to 47 per cent., an

[1] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 3.

average morbidity of 55 per cent. The fetal mortality varied from 19.05 per cent. to nil, according to the division of his cases, making on the average a fetal mortality of 8 per cent.

He calls attention to the necessity for selecting suitable cases for operation, and also that it is necessary to have a complete aseptic technique and abundant assistance.

Especially valuable is his analysis of 23 operations, where he has studied the permanent results which followed. In 6 cases no bony union occurred; in 4 incomplete union; in 7 the complete formation of bone could be demonstrated by the *x*-rays. The diagonal conjugate was variously enlarged among these patients, and there were a considerable number in whom unusual mobility existed in the pelvis. In all, he has collected 15 cases in which spontaneous birth occurred after pubiotomy with fully developed children.

Lichtenstein[1] draws attention to the indications for version and extraction in the light of the operation of pubiotomy. He quotes the results of 154 cases of *version and extraction*, of which 110 were performed before pubiotomy and 44 after. The mortality for the children in the first group was 32.82 per cent., and in the second, 13.64 per cent. The entire fetal mortality of these operations was 22.62 per cent.

Rühle[2] reports from the clinic at Elberfeld 4 cases of pubiotomy. The mothers recovered, but in all the puerperal period was complicated, lacerations were partially healed, and complete bony union could not be demonstrated. None of the children died from birth pressure.

Preller[3] reports 13 pubiotomies. One of these patients died from injury and infection received during the operation, and the puerperal period was complicated in a number of the cases by injuries to the vulva, vagina, or bladder. The pelvis was enlarged after the operation and its mobility much increased. The degree of bony union varied in the different cases.

Martin,[4] in 39 pubiotomies in the clinic at Berlin, saw in 3 cases injuries to the bladder and urethra. He considers the opening of the pelvis an operation requiring skill and experience, and urges the employment of the gauze tampon in the womb and in the vagina to check hemorrhage.

Preller[5] reports a case of *repeated* pubiotomy in the same patient, in which the second operation proceeded without especial difficulty and gave a good result. Although the patient became pregnant soon after the first operation, bony union in the pelvis had occurred.

Sigwart[6] reports 5 pubiotomies performed in private houses. These mothers recovered, with various complications in the puerperal period,

[1] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 3.
[2] Ibid., Band lxxxii.
[3] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 5.
[4] Ibid.
[5] Zentralblatt f. Gynäkologie, 1907, No. 20.
[6] Ibid.

and one of the children died. Delivery was effected by forceps or version.

Improvements in the technique of the operation are suggested by Walcher, who believes that many cases of pubiotomy would be prevented, and thus injuries to the mother avoided, if physicians would endeavor to procure delivery with the patient in Walcher's position. In 3000 labors he performed pubiotomy but 15 times, proceeding in the other cases by the method described.

Truzzi,[1] after pubiotomy, inserted a piece of calve's rib, 14 mm. wide and 3 cm. long, which had been decalcified and soaked in 19 per cent. alcohol, and then thoroughly washed with salt solution, between the severed halves of the pubis. It was unnecessary to use stitches, as pressure held the bone in position. The pelvis united well with a firm bandage, and remained considerably enlarged.

Röntgen ray pictures of two patients subjected to pubiotomy were recently exhibited by Frank[2] showing fibrous union three months after operation.

Wound of the bladder after pubiotomy was reported by Seitz,[3] the mother making a good recovery. By the use of the cystoscope twenty days after operation, the wound in the bladder on the side on which the operation had been performed, could be demonstrated. The ureters were normal, the wound had partially healed, its tissue forming a diverticulum.

Hernia after pubiotomy was observed by Mann.[4] After the operation the patient had a pus-discharging sinus from the upper border of the pelvis, through which a piece of bone finally emerged. The patient walked with difficulty. Seven months after the operation she could do but the lightest work. The fistula finally closed; five months after this the patient again became pregnant, and on examination was found to have pain and swelling in the ileo-sacral joint, with increased mobility. The patient had a spontaneous premature labor at seven months. The child was in breech presentation and was extracted by a midwife. Four months afterward a hernia developed in the scar of the operation.

The treatment of injuries received during pubiotomy is described by Kroemer.[5] He draws attention to the importance of injuries to the urinary tract in view of the danger of septic infection following such complication. He reports a case where, after pubiotomy and extraction with the forceps, bloody urine was removed from the bladder by catheter. Examination showed a wound in the tissues near the urethra produced by bony fragments. This was closed by suture, and the patient recovered after a complicated puerperal period, which was greatly prolonged. She left the hospital fifty-seven days after the operation, complaining of pain upon walking.

[1] Zentralblatt f. Gynäkologie, 1907, No. 20.
[2] Ibid.
[3] Ibid., No 17
[4] Ibid., No. 44.
[5] Ibid., No. 41.

The next pregnancy was terminated by pubiotomy, with the hope that the patient would deliver herself spontaneously. This, however, failed, and it was necessary to complete the delivery of the child by vaginal Cesarean section. This was terminated by version and extraction. Mother and child recovered.

Extracts from the Russian literature of the operation will be found in the *Zentralblatt f. Gynäkologie*, No. 34, 1907. The reports of these operations are not essentially different from those already quoted, operators agreeing that its performance should be limited to hospitals, and one operator criticising the Döderlein needle, because it bends too easily.

Death after pubiotomy was reported by Hammerschlag.[1] His patient was a Polyclinic case, autopsy showing distention of the intestine, bloody serum in the abdomen, the tissues behind the pubis greatly bruised, and infiltration with bloody serum. The pubiotomy wound had made an opening 3 cm. long into the bladder.

Rainer[2] draws attention to Truzzi's experiment, already described, in the introduction of decalcified calve's rib between the severed halves of the pelvis. He has experimented upon rabbits, operating upon 16, 10 of them surviving; and in 9 he was able to secure a radiograph of the pelvis. He found that when dead bone, whether decalcified or not, was used, the bone acted as a foreign body, inducing necrosis in the surrounding tissue, or being expelled with suppuration. In some cases this bone remained as a foreign body in the connective tissue. The pelvic wound healed by fibrous union. It is probable that in order to secure a good result one must introduce bony material of the same relative thickness with that of the pelvic wall.

Attention is called to the fact that while one may experiment upon animals, upon the human subject one must be sure of his ground before proceeding with this operation.

Offergeld discusses the chemical and histological aspect of the operation.[3] He finds that in from eight to ten days after operation there is an entire absence of the deposit of young bony tissue, and that two weeks after operation the fibrillary connective tissue of the bony capsule which forms after operation, has disappeared and given place, in favorable cases, to the deposit of osseous tissue. Extravasated blood is absorbed after the operation, and periostitis and osteomyelitis are also observed. From sixteen to eighteen days are required for permanent union, and this is not complete in from four to five weeks after the operation. Microscopic examination of these cases shows that one must not expect genuine bony union at first. The tendency is to the formation of a false joint, for which the extravasated blood present after the operation is largely responsible.

[1] Zentralblatt f. Gynäkologie, 1907, No. 33.
[2] Ibid., Nr. 45.
[3] Monatsschrift f. Geburtshulfe und Gynakologie, 1907, Band xxvi, Heft 1 und 2.

Offergeld experimented with different solutions, to observe whether he could increase the tendency to the formation of bony tissue. He finds that the tissue is deficient in the deposit of bony material, and by analyzing the tissue formed in the joint he comes to the conclusion that one must expect but partial bony union with largely connective tissue. He finds that this is largely due to the action of the saw in the operation, and to fluids formed by the hemorrhage and congestion following the operation, which prevent the deposit of a normal bony tissue.

Offergeld[1] has also experimented upon the treatment of infected pubiotomy wounds. He finds that where these wounds communicate with the vagina septic infection usually follows, frequently proceeding to a fatal issue. He knows no method by which the medulla of the pelvic bone can be protected from septic processes arising in the vagina and communicated to the pubiotomy wound. He experimented by causing venous hyperemia in the parts. He applied bandages, causing compression, from twenty-two to twenty-three hours of the day, in such a manner as to make continuous pressure, followed by total intermission from two to four hours, or dividing the pressure into two portions of from ten to eleven hours each. There was no special fall in the temperature, but the patient's general condition became much better. The method of treatment should be maintained until the temperature and pulse are normal and there is a desire for food. Purulent discharge and pain in the severed bones must cease. As a rule, from ten to fourteen days is required to obtain a good result.

His experiments lead to the belief that the production of venous hyperemia in infected pubiotomy wounds is a more valuable method of treatment than the use of sera.

Brun reports in the clinic at Trieste[2] three cases of pubiotomy by Gigli's method. The result of the operation was good, and radiographs of the pelvis taken after operation demonstrated the fibrous but not bony union.

In *Surgery, Gynecology, and Obstetrics* for February, 1908, Döderlein reports a case in which pubiotomy was performed in a contracted pelvis whose true conjugate was 8 cm. Fetal heart sounds could not be heard. Forceps had been applied without avail.

Believing that the child might be living, pubiotomy was performed by Zangemeister's method, dividing the bone with a Gigli saw. The child was delivered by version. The child was dead, and the mother's recovery was complicated by stitch-hole abscess, edema of the labia, and fever. Three months afterward there was bony union with tenderness over the site of operation.

If one summarizes the literature of pubiotomy for the past year, he

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxvi, Heft 6.

[2] Annali di Ostetricia E. Ginecologia, 1907, No. 6.

finds that the operation is frequently done in Continental clinics. It has received no marked favor at the hands of English and American operators, who prefer the induction of labor, with the use of Pommeroy's and other dilating bags, and extraction by version or forceps. If fetal mortality is to be considered, and operations are to be elective, delivery by abdominal section must be seriously considered before proceeding to pubiotomy. Dangerous wounds in the vagina, bladder, and urethra occur when this operation is performed upon poorly developed primiparæ. The danger of septic infection is considerable, hemorrhage is frequent, and the puerperal period often complicated. The mortality for the child remains higher than that of the elective Cesarean section.

Justice should be done to the operation, and like all the major obstetric operations, it is successful when performed upon sound and uninfected patients by skilful operators using good judgment, and having abundant assistance and good aseptic technique. It should not be undertaken by those who cannot fulfil these requirements.

Delivery by Abdominal Section. The literature of this important operation has increased considerably during the past year, and the results in selected cases show a steadily diminishing mortality.

Sellheim[1] has studied the possibility of performing delivery by abdominal section without opening the peritoneum or, as he terms it, by extraperitoneal uterine incision. He reports two cases operated upon by the following method:

The anesthesia employed was scopolamine-morphine with spinal anesthesia. The patient is placed in position with the pelvis elevated and a transverse incision made above the pubis through the skin and subcutaneous fat down to the fascia. The vessels encountered are carefully ligated. The fascia is then opened transversely and two flaps, above and below, are formed. These are fixed by sutures so that the linea alba is exposed for a distance of 20 cm. The recti muscles are then divided, with the peritoneal and subperitoneal connective tissue separated from the inferior surface of the recti. The urinary bladder is then partially injected to clearly locate its upper border. The peritoneal and connective tissue is then separated from the bladder by pressure with gauze sponges and blunt-pointed scissors until the surface is exposed. The bladder is then pushed downward and the abdominal tissues pushed upward as far as the body of the uterus. The bladder is held in its depressed position by a suitable retractor. The cervix is then opened longitudinally and its edges fastened by a blunt-pointed clamp. The incision is continued downward to the vaginal junction and upward to the lower border of the uterus. The membranes are then ruptured and the child delivered through this incision, when the umbilical cord is tied and cut. Ergot is then injected, the placenta delivered

[1] Zentralblatt f. Gynäkologie, No. 5, 1908

manually, the uterus made to contract, and a tampon with iodoform gauze inserted, the end of which is carried downward through the vagina. The uterine wound is closed with buried catgut stitches and its superficial surface with a continued catgut stitch. The position of the vagina is then made horizontal. The bladder is then brought up into its normal position, the connective tissue brought together by buried catgut stitches, and the recti closed with continuous catgut stitches. The fasciæ are then united and the superficial wound closed.

Both operations proceeded favorably, and were notable for the absence of hemorrhage. The children cried immediately upon delivery, and did not manifest the apnea which is commonly seen after the usual abdominal delivery. Forty minutes were occupied in each operation. The spinal anesthesia consisted in the injection of stovain with adrenalin.

The patients made good recoveries, and were able to be about much sooner than after abdominal section.

Küstner[1] reports three deliveries by abdominal section for unusual indications.

The first patient had previously been operated upon for ventrofixation, and the uterus was firmly attached to the anterior abdominal wall by broad bands of adhesions. It was necessary in this case to perform hysterectomy after the delivery of the child. On opening the abdomen it was found that the previous operation, followed by pregnancy, had resulted in the enormous distention of the posterior wall of the uterus, while the anterior remained firmly adherent.

The second section was performed for an echinococcus cyst in the pelvis, complicating pregnancy. This is the fourth case on record performed for this complication. The child was asphyxiated and could not be revived. The postmortem examination showed extravasation of blood at the base of the brain. The uterus was extirpated in this case as the echinococcus cyst in the pelvis was so situated that it was impossible to remove it and retain the uterus. The mother made a good recovery.

The third operation was performed upon an ape in the Zoölogical Garden for an overgrown fetus. Examination showed that the cranium of the fetus was too large to enter the pelvis. Labor pains had developed in such severity that the fetus was killed by uterine contractions. Celiohysterectomy was successfully performed, the mother making a good recovery.

In the *Zentralblatt f. Gynäkologie*, 1907, No. 48, is the report of several cases of Cesarean section for contracted pelvis by Russian operators. This operation resulted successfully, and illustrates the adaptability of the operation.

Atresia of the vagina in a patient who had been twice operated upon

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxvi, Heft 4.

for serious lacerations, was the condition which indicated delivery by abdominal section by Muratow in Kiew.[1] The patient made a complete recovery.

Routh[2] performed delivery by abdominal section on a patient who had been operated upon for vesicovaginal fistula, produced in a very difficult delivery through the vagina. To prevent further impregnation the uterus was amputated. The mother and child made a complete recovery.

In the patient's first labor she had been attended by a midwife, who had torn off the anterior lip of the cervix and severely injured the patient, supposing the cervix to be the placenta.

Routh appends to his paper a table of 30 cases of delivery by abdominal section for atresia of the vagina. These patients had been injured by previous labors, and some of them had been repaired by operation. The maternal mortality in these patients was 6 (or 20 per cent.). The fatal cases occurred before delivery by abdominal section had become perfected; 25 of the 30 children had survived.

Sinclair[3] illustrates the possibility of repeated abdominal delivery in his report of the case of a dwarf on whom four abdominal deliveries were performed. The incision was made through the previous scar to avoid opening the peritoneal cavity. In spite of all precautions, a small opening was made, which was closed by suture and did not complicate the patient's recovery. At each operation the uterus showed no essential trace of the former incision, the sutures having been completely absorbed.

Sinclair refers to Wallace's paper on repeated Cesarean section, in which are given the results of 43 cases operated upon twice, 15 cases operated upon three times, 1 case operated upon four times, and 1 case operated upon five times.[4]

Sinclair objects to sterilization and to hysterectomy as complicating the mother's recovery, and being an unjustifiable procedure. He believes that in operating an effort should be made to secure adhesions between the abdominal wall and the uterus. He describes one of his cases in which he united the parietal peritoneum with the uterine wall to secure this result. He also sutured the vesico-uterine fold laterally to close the fold and prevent the intrusion of the intestine. Sinclair's patient was a greatly deformed woman who had been a patient in a work-house hospital, and it seems to me that the question must arise as to the advisability of continuing the procreative power of such an individual. The four repeated operations are more interesting as a surgical experiment than as operations done in the interest of the patient, or of society at large.

[1] Zentralblatt f. Gynäkologie, 1907, No. 8.

[2] Journal of Obstetrics and Gynecology of the British Empire, November, 1907.

[3] Ibid.

[4] Ibid., December, 1907.

Bland-Sutton[1] had the opportunity of examining the uterus four years after delivery by abdominal section. The patient was operated upon a second time by Sutton for an ovarian fibroid, and it was necessary in controlling the hemorrhage to remove the uterus as well. With a magnifying glass the sutures used to close the uterine incision could be made out, and their position was clearly defined. On microscopic examination, the material embedded in the suture tracts was fibrous. It is possible that silk was employed in the original operation.

In discussing this paper, Spencer described a case in which Cesarean section had been performed seven years previously, the silk sutures remaining quiescent until the patient became infected with syphilis. An abscess then formed around one of the stitches, and the suture was removed, when the sinus closed. The silk appeared to be unchanged.

Sieffart[2] reports two cases of *eclampsia* to which he was called in consultation, and which he delivered by abdominal section. The patients were taken hurriedly to the hospital in a motor car, and the operation performed as soon as possible. The mothers and children recovered.

His third operation was performed upon a girl fourteen years old, having a flat pelvis and great edema of the external genital organs. On opening the abdomen the abdominal tissues were found edematous and containing much fluid. Mother and child recovered.

In these three cases the motor car was used with great advantage in transferring the patients rapidly from their homes to the hospital for operation.

The obstetrician is occasionally confronted with cases in which the cavity of the embryo has become infected, and the problem arises: By what method shall delivery be effected? Veit[3] discusses this question, and believes that delivery by abdominal section may be the safest procedure. He would conduct this extraperitoneally by making a transverse incision above the pubis, pushing upward the peritoneum and opening the uterus through the upper cervix or lower uterine segment. He quotes no cases in support of his proposition, but believes it to be a reasonable one.

Delivery by abdominal section upon the dead, or upon a mother about to perish, has long been considered a justifiable procedure. Seuffert[4] reports three cases from Winckel's clinic in Munich. In one of these the mother was dying of tuberculous meningitis; in the second, edema of the lungs and nephritis were present; and in the third, gliosarcoma in the right posterior portion of the brain. The child of the first mother died some time after delivery from anemia, atrophy of the intestine, and hypostatic pneumonia. The second child was delivered dead. In the

[1] Transactions of the Obstetrical Society of London, 1907, p. 194

[2] Zentralblatt f. Gynäkologie, 1907, No. 31.

[3] Monatsschrift f. Gebürtshülfe und Gynäkologie, 1907, Band xxvi, Heft 1.

[4] Archiv f. Gynäkologie, 1907, Band lxxxii.

third case, twin children were in the uterus, both of whom breathed feebly after delivery, but could not be resuscitated.

Seuffert quotes Lange's cases of abdominal delivery, following the death of the mother, as 141 cases, with 3 living children; Schwarz, 107 cases, with no living children; Kehrer, 61 cases, with one living child; Horwitz, 379 cases, with 5 living children; Dorn, 90 cases, with no living children; Winckel, 32 cases, with 11 living children; Bauer, 15 cases, with 10 living children; and Dicke, 34 cases, with 19 living children.

A study of these cases shows that those operations were successful in saving the child which were performed at the very moment of death in hospitals, and where the mother died from some condition which did not affect essentially the life of the fetus. Cases of virulent toxemia with or without eclampsia, tuberculosis, and septic infection of the mother, offer little prospect of saving the life of the child.

Abdominal delivery was performed by Sharpenack[1] in a case where fibromolluscum in the vagina and vulva made delivery through the vagina impossible. A full-term, vigorous child was delivered, and mother and child recovered from the operation.

One of the essential dangers in delivery by abdominal section is hemorrhage. In the majority of cases, however, this does not occur, and severe hemorrhage after delivery by abdominal section is unusual.

Lepage[2] performed delivery by abdominal section in a patient where the uterine wall was very thick, and unfortunately relied upon catgut to close the uterine muscle. Postpartum hemorrhage occurred, which required the performance of the Porro operation twenty-four hours after the first section. The patient recovered.

I have included this report to draw attention to the fact agreed upon by all experienced operators that catgut is an especially dangerous material for closing the uterus in this operation, as deaths which have occurred from hemorrhage have followed the use of catgut; and while theoretically it would seem that the complete absorption of the sutures would be desirable, this advantage is not to be compared with the risk of bleeding. Silk is the only reliable material for this operation.

Leopold[3] tabulates the results of 229 cases of delivery by abdominal section. Taking the entire series, the maternal mortality is 4.9 per cent.

In trying to determine in which of these cases the operation was improperly chosen, Leopold describes one case where the peritoneum was injured during the operation, and where death resulted from sepsis. The patient died from pleuropneumonia, with streptococcic infection of the genital organs. This case is considered as preventable.

In the second case death occurred four days after the operation with

[1] Zentralblatt f. Gynäkologie, 1907, No. 23.

[2] Ibid., No. 19.

[3] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 3.

symptoms of pneumonia. An autopsy could not be obtained, and the question is raised as to whether this too was not a case of septic infection.

The third case terminating fatally from peritonitis followed a wound of the transverse colon. This patient had been operated upon previously by abdominal delivery, and the abdominal tissues were firmly adherent at the second operation.

In a fourth case the mother died from peritonitis following retroflexion, and incarceration of the uterus and ileus. An effort was made to save the mother by performing hysterectomy on the sixth day. Another case died after operation from gonorrheal endometritis; the Porro operation, Leopold thinks, should have been selected.

A sixth case is described in which the patient perished from thrombosis in the operation wound, the thrombus having become infected. The neighboring Fallopian tube contained no pus, but the parametric tissues were greatly swollen. These fatalities occurred in the early history of the operation, when its precise indications were not so clearly defined as now, and when methods for securing asepsis were not as efficient.

In reviewing the fatal cases, in one, pubiotomy might have saved the mother; in one, the Porro operation; in another, complicated by adhesions, following a former operation with gonorrhea, the Porro operation should have been chosen; in the fourth, pubiotomy; in the fifth, complicated by gonorrhea, the Porro operation; in the sixth, some defect in asepsis was evidently present.

As regards the subsequent history of the children delivered in these cases, where it has been possible to trace them, 80.8 per cent. lived to be eight years old, in cases where celiohysterotomy was done; where the Porro operation was performed, 78.5 per cent. of the children reached their eighth year.

It is questionable as to what bearing upon the operation the persistence of infant life to the eighth year may have. It would seem quite as fair to consider children as having been successfully delivered which were ever able to nurse the mother, or were artificially fed, and left the hospital with her in good condition.

The question as to what shall be done for patients who in previous severe labor have suffered injuries causing scar tissue in the birth canal, and who subsequently become pregnant, is raised by Dirner.[1] His patient had almost complete closure of the vagina following infection after difficult labor. This had been modified by an extensive plastic operation.. The patient became pregnant and had a slightly contracted pelvis. The life of the child was greatly desired. To what extent the scars in such tissue would yield, permitting birth through the vagina, is the question submitted by Dirner. Before the Gynecological Section of the College of Physicians at Budapest, the majority of opinions favored delivery by abdominal section.

[1] Zentralblatt f. Gynäkologie, 1907, No. 14.

The total removal of pelvic tissue complicating pregnancy is reported by Leipmann.[1] In addition to the carcinoma present a pure culture of the streptococcus was found amid the carcinomatous tissue. To disinfect the tissue 10 per cent. formalin tampons were employed, and the mucous membrane of the vagina was stitched over the carcinoma to prevent infection of the peritoneum. Salt solution was also used for irrigation. Antistreptococcic serum was given. The patient recovered from the operation, although the puerperal period was complicated by phlebitis.

My own recent experiences in delivery by abdominal section strengthen my belief in the value of the operation. In 45 uninfected patients there has been one maternal death and the loss of no child. The maternal mortality was 2.22 per cent. The last 5 cases, in a total of 53, were unusual. One was performed for contracted pelvis and ovarian cyst with twisted pedicle, becoming gangrenous, and being removed at the same operation. One was a repeated operation, celiohysterectomy, in a small dwarf, the subject of rickets or achondroplasia. One was performed in a private house to complete an induced labor in a patient who had previously been delivered by a very difficult forceps operation. One was a Porro operation upon a woman in whose case forceps, version, and craniotomy had been tried, who had been in labor two days and nights, and was brought to the hospital upon a cot, in a railway train, a distance of seventeen miles. Upon opening the uterus its interior was greenish and stinking. The fifth operation was for the relative indications, in the interests of both mother and child.

The septic case, in which the Porro operation was performed, made a tedious but complete recovery. All these patients recovered.

Vaginal Cesarean Section. The first vaginal Cesarean section performed in South America is reported by Zarate.[2] His patient was a multipara who had suffered from syphilis of the larynx. She was admitted to the hospital at the end of pregnancy with difficult breathing and very rapid pulse, the result of consolidation in the right lower portion of the chest, with bronchitis and narrowing of the larynx from scar tissue. The patient's condition became so critical that vaginal Cesarean section was performed without anesthesia. The operation was done as rapidly as possible; the child was partially asphyxiated, but revived. The mother breathed better immediately after the operation and recovered, being able to nurse her child.

Examination of the larynx during her convalescence revealed syphilitic lesions with cicatricial narrowing of the space between the vocal cords.

Rotter[3] reports four cases of vaginal Cesarean section. The first was performed upon a multipara who suffered from mitral insufficiency with failing compensation. Edema of the lungs was threatened. The oper-

[1] Zentralblatt f. Gynäkologie, 1907, No. 11.

[2] Ibid., No. 52.

[3] Ibid., No. 39.

ation was performed without anesthesia and a dead child was delivered, and fifteen minutes after operation the mother died. At autopsy the heart muscle was found extensively degenerated. The delivery of the child occupied but five minutes, and the method of operation seemed especially adapted to the case.

His second patient was comatose with eclampsia, and operation was performed without anesthesia and proved successful, the mother and child both making good recoveries.

The third operation was also performed for eclampsia, the child surviving but the mother's puerperal period being complicated by pneumonia, from which she recovered.

The fourth operation was done upon a multipara suffering from a severe heart lesion. When labor began the patient speedily became cyanotic, with bloody expectoration, her condition being alarming. The child was delivered with narcosis and survived. The mother did well until the seventh day of the puerperal period, when she became maniacal, and was transferred to an asylum.

Nádory reports 5 cases of vaginal Cesarean section—3 for carcinoma, and 2 for eclampsia. In the carcinomatous cases the children survived; two of the mothers survived the operation, remaining in good health, and one died from malignant disease two months after operation. The eclamptic case did well.

Rupture of the Uterus.—Kerr[1] describes a case of complete rupture of the uterus with escape of the fetus into the peritoneal cavity, recovering after the complete removal of the uterus. The patient made a complete and surprising recovery, as she was in a condition of severe shock at the time of the operation. Kerr calls attention to the fact that pregnancy in half a bipartite uterus may simulate rupture of the uterus; also in twin pregnancy, the irregular contour of the womb may give rise to a suspicion of rupture should the patient become collapsed during labor—so a tumor complicating pregnancy might also occasion such a doubt. Where the fetus is situated obliquely in the uterus and becomes impacted, uterine rupture may be suspected, because of the irregular contour of the pregnant womb.

Among the 13 cases observed by Kerr, hemorrhage was severe in but 3; others report severe hemorrhage in about one-third of all cases. While the hemorrhage may not be profuse, it continues, the patient becoming gradually weaker until death ensues. The symptoms develop gradually, and thus the physician may be deceived as regards the severity of the complication. It is often difficult to distinguish between complete and incomplete rupture, and a positive opinion should not be expressed upon this point.

The results in Kerr's 13 cases were as follows: 2 died without opera-

[1] British Medical Journal, August 24, 1907

tion; 3 cases of incomplete rupture treated successfully with the tampon; hysterectomy with extraperitoneal treatment of the stump was performed unsuccessfully in one case; hysterectomy with dropping of the stump was performed in 5 cases, 2 of which recovered and 3 died; and the entire removal of the uterus was practised in 3 cases, of whom 2 died and 1 recovered.

At a meeting of the Obstetrical Society in Berlin, Jolly[1] exhibited a specimen from a case of rupture of the uterus. The patient was a multipara, having a normal pelvis, who had passed successfully through seven parturitions. The head was presenting, and with good uterine contractions descending to the pelvic floor. The head failed, however, to rotate, but remained transversely. The patient had strong labor pains for two hours, which failed, however, to secure rotation of the head. The interval between the pains grew less, the patient's strength failed, and she began to be very restless. Suddenly uterine contractions ceased, the vagina became anemic, and the pulse was small and frequent. Above the pubis the tissues were very sensitive to pressure. The head stood transversely, and fetal heart sounds could not be made out. After a cautious trial with the forceps the cranium was perforated and the head readily delivered. The shoulders failed to follow, and the clavicle was severed and both arms brought down. The child was unusually developed, weighing 9 pounds. The placenta was delivered readily after the extraction of the child, the point of rupture was tamponed, and the patient transferred to the hospital, where she soon died from acute anemia. At autopsy, rupture of the uterus had taken place near the right cornu. This point of rupture opened into a considerable cavity in the right parametrium, which was filled with blood. There was no direct communication with the abdominal cavity, the rupture being practically incomplete. It is especially interesting to observe that rupture did not occur until the head had entered the pelvic cavity and descended to the pelvic floor.

Tissier and David[2] report the case of a primipara eight months advanced, who sustained a serious accident followed by severe pain resulting from rupture of the uterus. The patient was immediately subjected to operation, and a fetus weighing 5 pounds was removed from among the coils of intestine. The child was removed from the mother's abdomen, and mother and child made good recoveries.

Schütte[3] has observed 14 cases of uterine rupture—8 complete and 6 incomplete. Of these patients, 3 died, 1 with complete rupture of the uterus and 2 with incomplete.

The writer urges, so far as treatment is concerned, that the first point of importance is to stop completely and rapidly the hemorrhage which

[1] Zeitschrift f. Geburtshülfe und Gynäkologie, 1907, Band lx, Heft 3.

[2] Zentralblatt f. Gynäkologie, 1907, No. 45.

[3] Monatsschrift f. Geburtshulfe und Gynäkologie, 1907, Band xxvi, Heft 2.

is present. It is also of great importance to prevent infection by removing retained blood, which forms a culture ground for bacteria. It is believed that the operation most suited to fulfil these indications is complete removal of the uterus after abdominal incision. Drainage through the stump of the broad ligament into the vagina may be conveniently carried out after this operation by the use of gauze. He draws attention to 3 cases treated in this manner successfully.

Scipiades[1] gives the salient points in the treatment of rupture of the uterus from the statistics of 97 cases. In incomplete rupture, conservative treatment with the tampon is indicated. In competent hands there is very little difference in the result between the conservative method and that of operation. It is essential that patients be disturbed as little as possible in transportation in these cases. Scipiades states the mortality for the mother as 65.8 per cent. following rupture of the uterus. He contrasts this with the 5 per cent. mortality following delivery by abdominal section. He states the mortality of premature labor as 18.7 per cent. in contrast with that given for rupture of the uterus.

The Physiology and Management of the Third Stage of Labor.—Heil[2] contributes an interesting paper upon this subject. He divides the third stage of labor into two periods, the first of which comprises the separation of the placenta, membranes, and decidua; and the second, the expulsion of the same.

The interesting question arises as to when placental separation occurs. Lemser believes that the placenta was entirely separated, as a rule, by the time that the expulsion of the child was completed. In 168 cases he found the placenta at the mouth of the uterus 120 times immediately after the birth of the child, 25 times in five seconds, 7 times in eight seconds after the childbirth. In only 6 cases was this delayed longer than one minute.

Dohrn believes that the placenta and membranes are separated on the average one-quarter of an hour after the birth of the child. Werth believes that the placenta, at least in part, separates from the uterine wall when the child is expelled. Several pains are required to secure the passage of the breech and limbs of the child, and during these pains the placenta separates and follows the child's body out of the upper segment of the uterus. When the breech of the child is rapidly born by only one strong contraction, or by traction made upon the shoulders, the placenta does not separate so soon, and requires several pains for its separation and expulsion. Schroeder believed that it was impossible to state definitely the moment at which the placenta separated, but that this process was not complete at the moment when the head was expelled. Gessner and Cohn thought that so-called after-pains occur

[1] Zentralblatt f. Gynäkologie, 1907, No. 26.

[2] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 1.

when the placenta is separated and expelled. Runge, Burger, Cohn, Strassmann, and Meissner believed that within fifteen minutes after the birth of the child the placenta and membranes are wholly or partially loosened from the uterine wall. Ahlfeld thinks that thirty minutes is occupied in the loosening of the placenta and its expulsion into the upper portion of the vagina. Baumgarten found a variation in the time occupied in the expulsion of the placenta between primiparæ and multiparæ, from nothing to thirty minutes. The average in primiparæ was 25.3 minutes; in multiparæ 16.3 minutes. Strassmann would designate the placenta fifteen minutes after the birth of the child as capable of expression, but would not consider it entirely ready for expression until half an hour had passed, when not only had the placenta left the upper uterine segment, but the membranes had loosened, and placenta and membranes were in the vagina.

It is for clinical purposes of great importance to distinguish when the placenta separates and when it is ready for expression. It is also important that this be recognized if possible, without repeated internal examination. Credé believes that when three or four after-pains have occurred the placenta is ready for expression. Lindfors describes the signs indicating the separation of the placenta as increase in the length of the umbilical cord, from 12 to 16 cm., the ascent of the fundus 5 to 7 cm., flattening of the body of the uterus anteroposteriorly, increase in its mobility, a sense of resistance of a semielastic or boggy nature above the symphysis, occasioned by the placenta in the upper portion of the vagina, and a marked groove or depression between the upper expulsive segment of the uterus and the extended cervix containing the placenta.

Strassmann believes that when the placenta is expressed the operator can detect the fact that cotyledons may be left behind, and that when these separate from the wall of the uterus a sense of crepitation is observed. Various writers ascribe importance to hemorrhage as a sign of separation of the placenta. Ahlfeld observed that when the separation of the placenta was left entirely to nature, in 66 per cent. of the cases a minimum of blood was lost. Strassmann found also that when the placenta was not separated the umbilical vein was overdistended with blood when the operator made pressure upon the uterus when the umbilical arteries were contracted and empty of blood. A wave of fluctuation in the umbilical vein could be detected when pressure was made upon the fundus of the uterus. This sign is observed when the placenta separates. This phenomenon is ordinarily seen in ten or fifteen minutes after spontaneous labor, and when the placenta is adherent it is observed two or three hours after the birth of the child. When the placenta partially separates this sign naturally fails. Ahlfeld detected the lengthening of the umbilical cord in 95 per cent. of all cases when the placenta separated. On the average, the fundus of the uterus ascended 5 cm. during the same time. Baudelocque laid stress upon

the fact that so soon as the placenta is loosened and is expelled into the upper portion of the vagina the body of the uterus grows much harder and smaller. Other writers unite in this observation. By all of the older authors the uterus is described as a hard ball so soon as the placenta is loosened and expelled. No mention is made by them of other changes in the uterine form or consistence at this time.

Heil's observations were made upon 120 cases. Modern authors unite in assertions that the uterus changes its shape and consistence when the placenta is loosened and expelled. Burger believes that these changes occur in fifteen minutes after the birth of the child. Freund, however, was the only writer who distinctly laid stress upon the flattening of the uterus from before backward as a reliable sign of the separation of the placenta.

Heil raises two questions in this connection: Is the anteroposterior flattening of the uterus a reliable sign that the placenta has separated in the body of the uterus and passed thence into the lower uterine segment? And at what period after the birth of the child is this change to be observed?

Heil conducted his observations by placing the patient in the lateral posture for delivery, and also for the third stage of labor, or upon the back across the bed. Very light pressure was then made upon the fundus of the uterus five minutes after the umbilical cord had been tied and cut. So soon as the uterus was observed to flatten anteroposteriorly the placenta was expressed. Very gentle pressure was employed, and if the first effort was unavailing the operator waited. It was observed that the anteroposterior flattening was found only in cases where the uterus was not tightly contracted.

In the 120 cases were 41 of spontaneous labor when the head presented, including 2 cases of face presentation. In this series there were 54 cases of forceps, 12 of breech presentation, 5 of version for transverse position, and 5 of version because the head presented unfavorably; there were 3 cases of twins. Among these patients, 78 were primiparæ and 42 multiparæ. Anteroposterior flattening of the uterus was not observed in 4 cases, or 3.3 per cent.; it was not distinctly present in 12 cases, or 10 per cent.; and was unquestionably recognizable in 104 cases, or 86.7 per cent.

This phenomenon occurred immediately after the birth of the child 4 times; within the first five minutes after childbirth, 14 times; in from five to ten minutes in 52 cases; from eleven to fifteen minutes in 20; from sixteen to twenty minutes in 9; from twenty-one to twenty-five in 3; and from twenty-six to thirty minutes in 2 cases; in 92 cases, or 88.46 per cent., this sign could be distinctly observed.

This phenomenon developed very late, after twenty minutes in 5 cases. The first was one of forceps delivered without anesthesia when labor had persisted for sixty hours. In the second case flattening of

the uterus did not develop until twenty-nine minutes after childbirth. The placenta was expressed with very light pressure. This patient had a transverse position, with prolapse of the arm and umbilical cord, and version had been performed. In the third case the forceps was used without anesthesia, the uterus did not flatten, and an effort made to express the placenta was fruitless fifteen minutes after the birth of the child. In twenty-four minutes the characteristic change in the uterus occurred, and the placenta was readily expressed. In a fourth case of spontaneous labor the flattening began eleven minutes after the child was born, was fully developed twenty-five minutes afterward, and the placenta readily expressed. In the fifth case the patient had been in labor two days; she was delivered by forceps. The change in the uterus occurred first thirty minutes after childbirth, and the placenta and a mass of clotted blood was expressed.

When the cases are analyzed, it is seen that in four of these the phenomenon of flattening of the uterus was not observed. The first of these was a forceps delivery, and the placenta was removed manually an hour after the birth of the child because profuse hemorrhage occurred. The second case was complicated by bleeding during labor, with prolapse of the umbilical cord, which could not be replaced. Version was performed, the child delivered, and ten minutes afterward the phenomenon of flattening had not occurred, but the placenta was delivered by very gentle pressure accompanied by several clots as large as the fist. The third case was that of twin pregnancy, in which fifteen minutes passed without flattening of the uterus after the birth of the child. The placenta was evidently attached low in this case, and as there were two joined placentæ, the one hindered the descent of the other. In the fourth case the patient was delivered with forceps because of uterine inertia, and the placenta was expressed by strong pressure ten minutes after the birth of the child in but 1.7 per cent. (that is in 2 cases); the phenomenon of uterine flattening was absent in a series of 120 cases; it was but partially developed in 9 cases, or 2.5 per cent.; it occurred normally in 115 cases, or 95.8 per cent.

This sign may be considered as reliable that the placenta has passed from the upper expulsive segment into the lower dilatable segment. It occurs normally in 90 per cent. of cases on the average. Where it was but partially present, or lacking, some anomaly was found in the third stage of labor to account for it. In normal cases it seemed to be true that this uterine flattening was characteristic of the emptied upper uterine segment. Where the phenomenon was established the placenta could be expressed immediately in 88.46 per cent. In most cases this condition was present in fifteen to twenty minutes. When, however, an effort is made to distinguish between a placenta which can be expressed and one which is ready for expression, it is found that among those already separated 17 per cent. are not yet ready for expression. Among

these patients 6.66 per cent. had fever during the puerperal period. When an effort was made to distinguish between primiparæ and multiparæ, there was found no appreciable difference between the time when the flattening of the uterus occurred. There seemed also no difference between spontaneous birth with vertex presentation and cases terminated by the use of forceps.

It seems clear from these investigations that in the average case the placenta has not only separated, but is ready for expression in half an hour after the birth of the child.

In conducting the third stage of labor, the operator should observe during ten or fifteen minutes after the birth of the child whether any portion of the phenomenon of flattening has declared itself. If traces of this alteration in uterine shape are seen, we may safely conclude that in half an hour after childbirth the expression of the placenta will result easily.

Ahlfeld's sign, the lengthening of the umbilical cord, is considered valuable as an indication that placental separation has occurred.

The Placenta. Angioma of the Placenta. Kermauner[1] has in all collected 71 cases of tumor of the placenta. He adds considerable literature upon the subject, and draws attention to Niebergal's paper, published in the *Monatsschrift f. Geburtshülfe und Gynäkologie*, Band 6, page 475.

Kermauner reports the case of a primipara aged nineteen years, who was perfectly normal so far as could be ascertained, and who had a normal pregnancy, terminating in spontaneous birth. The child was also normal, vigorous, and well-developed. The placenta was easily expressed in about half an hour after the birth of the child, and the puerperal period was normal.

On superficial examination, the placenta was not especially large or heavy. On the fetal aspect were several infarcts yellowish white, and covered by chorion. In one portion of the placenta there was an area as large as a half-dollar near the fetal border, whose color was yellowish violet, and which seemed apparently like a thin flat infarct. On section, this area contained a round tumor as large as a hazel-nut, dark brownish red in color, and with a shining surface. On microscopic examination, the tumor proved to be an angioma.

Two illustrations, one macroscopic and one microscopic, accompany the paper. It was supposed to be benign in nature, having its origin from villi of the chorion, and not encroaching upon the surrounding connective tissue. The exact mode of its formation or growth could not be demonstrated.

Clinically, the growth seemed to have no significance, but to be chiefly of anatomical interest. Its relation to polyhydramnios, albuminuria, hemorrhage, premature separation of the placenta, and infarcts could

[1] Archiv f. Gynäkologie, 1907, Band lxxxi, Heft 3.

not be definitely ascertained. It is possible that it might form a separate cotyledon of the placenta, and as such might be retained after the greater portion of the placenta has been expelled.

Schindler[1] reports 2 cases of angioma of the placenta. In the first, pregnancy, labor, and the puerperal period were normal; the child perished two days after birth from failure in the closure of the heart and congenital pulmonary conditions.

The second case was a primipara. The patient previously had been in good health, but had pain in the abdomen before entering the hospital, following a misstep and threatened fall. The labor was comparatively short; the child was somewhat asphyxiated, but speedily revived; the placenta was spontaneously delivered ten minutes afterward, and the puerperal period was normal. The child died six days after birth from inanition.

Both of these cases were chorio-angioma of the placenta.

A third case is reported of eclampsia in which the placenta showed small tumors through its substance, resembling angiomata, and also many infarcts. The tumors were not as sharply defined as angiomata and differed in the form and size of the villi, the origin and course of the vessels, the presence of empty and collapsed capillaries, and the increase in the endothelial elements in the capillary walls. The tumors, which were apparently angioma in the eclamptic placenta, seemed to have been essentially small areas of hemorrhage.

Seeligmann reports an interesting case of *placental infarcts.* The patient had abundant albuminuria with typical albuminuric retinitis. Labor was hastened by De Ribes' bag, and the patient was delivered by version. The child died three days after birth.

Subchorial cyst of the placenta is described by Blau.[2] His cases were three in number, the first two being those of healthy primiparæ, the third that of a vigorous multipara. The labors were spontaneous and the children were vigorous, and survived.

Beyond the anatomical description of these cases the paper does not contain matter of especial clinical value. The article is well illustrated, but the condition does not seem to have a bearing upon the mortality or morbidity of either the mother or child.

Glycogen in the Placenta. Driessen[3] contributes a paper giving the results of his observations upon the presence of glycogen in the placenta of animals, and also in the human subject. In animals he finds that the production of glycogen begins on the eighth day in the perivesicular decidual cells of the mother's uterus. From the ninth to the sixteenth day the formation of glycogen is greatest in a boundary zone between the fetal and maternal placental elements. In the fetal

[1] Archiv f. Gynäkologie, 1908, Band lxxxiv, Heft 2.

[2] Zeitschrift f. Geburtshülfe und Gynäkologie, 1907, Band lx, Heft 3.

[3] Archiv f. Gynäkologie, 1907, Band lxxxii

portion of the placenta there are deposited tissues formed from maternal cells rich in glycogen. The fetal placenta itself remains free from glycogen. The maternal endothelial cells and syncytium show no evidence of glycogen. In the second half of pregnancy the glycogen disappears and the placenta at term contains none, although maternal decidual cells still contain glycogen.

So far as the human subject is concerned, glycogen is found in the placenta during the early months of pregnancy. It is contained in the glands of the decidua, but not in the normal unchanged mucous membrane of the uterus. Where, however, a glandular hypertrophy exists, glycogen is found in half-moon-shaped cells and in the form of drops in the lumen of the glands. Where inflammation is present, as after abortion, glycogen is not found. It is absent from the epithelium of the cervix. Where the ovum is implanted in the Fallopian tube, glycogen is formed by the cells in the lining membrane of the tube. We have no evidence that glycogen exists in ovarian pregnancy. In the decidual cells glycogen may be found in many cases, but not in all. The young decidual cells seem to be free from it, and in the late months of pregnancy glycogen is very rarely found in the decidua. In the peripheral cells of placental formation glycogen is abundantly present.

The question naturally arises whether these are maternal decidual cells or hypertrophied cells from Langhans' layer. It is interesting to note that in the early stages of human placentation the ovum is surrounded by a layer of cells rich in glycogen. These cells are found where the tissues of the fetus and the mother come most closely in contact. Glycogen is also found during the first three months of pregnancy in Langhans' cells. As the placenta grows in size and increases in age, glycogen disappears until about the sixth month. The syncytium in all cases was found free from glycogen, but Langhans' layer of cells contained it abundantly; this is in accordance with the observations of most writers upon the subject, although Langhans himself states that glycogen is rarely found in these cells. In the connective tissue of the chorion and its villi, glycogen is found in the shape of nuclei situated upon the superficial layer of spindle cells. In the later months of pregnancy it is not always found. In the fetal vessels and endothelial cells Driessen could not demonstrate its presence. In the connective tissue its production did not seem to be limited to a given sort of cell, but it was found diffused irregularly in the larger villi of the chorion, and in the umbilical cord corpuscles were found in the vicinity of the great vessels. It is absent from the liquor amnii, but epithelial cells containing glycogen are found upon the amniotic surface of the umbilical cord. The maternal portion of the placenta was the principal site of glycogen and not the fetal. This is not so clearly defined in the human subject as in animals. In the fetal villi in the human subject, glycogen drops are often observed, and also in the connective tissue at the base of the large villi; but the quantity

is always less in the epithelial cells of the uterine glands than in the decidual cells. In the maternal tissues the glycogen is always endocellular. In the fetal connective tissue the small glycogen drops are extracellular, while in the glands of the uterus, glycogen exists in free drops and nuclei. In the human subject glycogen seems formed more in the glands of the spongy decidua than any other portion. The maternal endothelium and the fetal syncytium contain no glycogen. In the human subject it disappears during the first half of pregnancy, being usually most abundant between the third and eighth week. In the human placenta at term there is no glycogen.

Placental Metabolism. This very interesting subject has been studied by Acconci,[1] Ferroni,[2] Montalleli,[3] Fossatti,[4] Ballorani,[5] and Freund.[6]

Acconci doubts the importance of placental ferment in albuminoid metabolism of mother and child.

Ferroni found a ferment in the placenta capable of oxidizing tissue, and apparently a genuine enzyl. This is produced by the connective tissue of the placenta and the epithelium of the villi of the chorion.

The placental blood seems to be of less importance in oxidization than the ferments in the placental tissue. This exercises its influence primarily upon the blood of the fetus, and secondarily upon that of the mother.

Montalleli and Fossatti made interesting observations upon the disposition of fat in the villi of the chorion, and observed that when large quantities of fat were deposited in the placenta the nutritive function of the chorionic villi had been greatly disturbed, as in some cases of toxemia.

Fossetti observed fat in the villi of the chorion in healthy placentæ in the epithelial structure, but in cases of abortion and pathological pregnancy the fat was unequally distributed in the connective tissue of the villi. Placental ferments have a distinct action in the assimilation of this fat in healthy individuals.

Ballarani experimented with placental extract and sugar, and found that the extract was capable of reducing sugar.

Freund made 200 experiments with extracts of 52 placentæ by intravenous injection. He found that two toxic bodies could be isolated, one of which caused thrombosis and seemed to exercise its function upon the fibrin of the blood; the other seemed to be a pure toxin and capable of paralyzing the respiratory centre. It was not possible by chemical methods to isolate these toxic substances from the albuminoid bodies

[1] Italian Archives of Gynäkologie, vol. ii, p. 145.
[2] Annali di Ostetr., vol. i, p. 719.
[3] Ibid., p. 405.
[4] Ibid., p. 571.
[5] La Ginecologia, Anno iii, p. 513.
[6] Zentralblatt f. Gynäkologie, 1907, No. 26.

in the placenta. Substances obtained from the spleen, pancreas, liver, and kidneys, when given by intravenous transfusion, were also toxic like the placenta; while substances extracted from the muscle and brain exerted no influence. Intraperitoneal or subcutaneous injection had no effect. It was not possible to secure immunity by small but repeated doses.

It is evident from this and other experiments that the placenta contains a toxin which exerts its influence directly without thrombosis, and not through the kidneys. The explanation of this is found in the fact that the placental substance is in direct relation with the blood of the mother.

In this connection, Hofbauer's paper on the *Pathology of Eclampsia*[1] is of interest. He draws attention to the autolytic function of toxins produced in the glandular organs of the eclamptic patient, and especially in the liver. He believes that the placenta forms a very active ferment, whose influence is exerted especially upon the blood, producing alterations in its fibrin, with a tendency to thrombosis. He believes that eclampsia results largely from the action of the placental ferment, from degenerative processes in the heart, liver, and kidneys, and in some cases from alteration in the brain.

The Umbilical Cord. The Treatment of Prolapse of the Cord. Nossowitzky[2] in 10,809 labors collected 104 cases of prolapse of the umbilical cord—a frequency of 0.96 per cent. In 58 cases the vertex presented; in 26 there was transverse presentation; in 19 breech presentation; in one case the uterus ruptured with fatal result.

Among the children, 12 were dead when the physician was summoned, 15 died during delivery, 3 were born with symptoms of life but could not be revived, and 5 died a few hours after labor from asphyxia. In all, 35 children perished, a mortality of 33.6 per cent., and in cases subjected to treatment a mortality of 25 per cent.

The cause of this accident is usually failure in the development of the lower uterine segment, complicated by contracted pelvis, hydramnios, low attachment of the placenta, or marginal insertion of the cord. One or more extremities often prolapse with the cord.

So far as treatment is concerned, in the absence of the fetal membranes, a colpeurynter should be placed in the vagina. The patient should assume the lateral position or a position with the pelvis raised. In 20 cases so treated there was but one fatal result for the child. In these cases prolapse was not complete, but the cord presented at the pelvic brim. Where prolapse has developed the cord should be replaced, if possible, with the hand. In 13 cases this failed, 3 of the children perishing. Where the breech presented, replacement was not attempted, but the child was immediately delivered. Version and extraction were performed three times in primiparæ, one child perishing; 34 times

[1] Zentralblatt f. Gynakologie, 1907, No. 26

[2] Ibid., No. 21.

in multiparæ, with the loss of 8 children. The mortality was twice as great in cases in which the cervix was not fully dilated. In transverse positions requiring version, the mortality was 25 per cent. In extraction where the feet and limbs presented the mortality was lower. In 3 cases after version spontaneous birth occurred; and in 12 labors in which there was no attempt at treatment 11 of the children died.

A Tight Knot of the Umbilical Cord Occasioning Fetal Death. Frank[1] reports the case of a primipara who was very hysterical during pregnancy. At the sixth month the patient fell upon her abdomen in a slippery street, bruising the body and the knees. The amniotic liquid was slightly in excess, labor pains were weak, and fetal heart sounds could not be heard. As the child was probably not living, no attempt was made at forcible dilatation, but when the application of forceps was possible delivery was effected without difficulty.

A loop of cord was loosely coiled at the child's neck and easily separated. The child was dead and beginning to show signs of maceration. The placenta was normal, and 30 cm. from the placenta was a knot in the cord very tightly drawn. Above the knot the umbilical vessels were greatly dilated; below the knot the vessels were empty, contracted, and almost invisible.

The writer has collected 14 similar cases. Illustrations of various sorts of knots in the cord are appended. The frequency of this complication is estimated at from 1 per cent. to 0.4 of 1 per cent. in all cases. Tight knots are exceedingly rare, as in 31,590 births with 115 cases of knotting no case is reported where injury to the child resulted. The accident occurs more frequently in primiparæ than in multiparæ, and labors are usually spontaneous, but frequently prolonged.

Coiling of the cord and its effect upon the child is the subject of a paper by Holzbach.[2] The advice is usually given in labor to examine the neck of the child as soon as the head has been born, to observe whether the cord is coiled about the neck, and if necessary to loosen it. Holzbach believes that the moment when the head is born, danger for the child arises when the cord is coiled about the neck, which develops after the birth of the head. He believes that the danger is not so much in asphyxia as in interference of the cerebral circulation of the child and its consequences. The elasticity of the cord is such that in many cases it can be stretched to an extent estimated at 23 per cent.; in 93 per cent. of cases the cord after stretching returned to practically its original length. When cross-sections are made of cords that have been subject to great tension, it is seen that the vessels are very little diminished in size.

Holzbach doubts whether the circulation is much interfered with during labor by the stretching of the cord. He believes that when the physician attempts to loosen the cord from the neck of the child there

[1] American Journal of Obstetrics, June, 1907.

[2] Zentralblatt f. Gynäkologie, 1907, No. 7.

is very considerable danger that he will make traction upon the placenta, and that complications may arise from this cause during the third stage of labor.

Looping of the umbilical cord during labor has been studied by Forssell[1] in the Obstetric Clinic at Stockholm. He believes that individual vessels of the cord can be torn through the bursting of a varix in the umbilical vein, with the formation of a hematoma of the cord. Individual vessels of the cord can also rupture with a discharge of blood directly into the cavity of the amnion. Where the insertion of the cord is velamentous, individual vessels may also loop during their passage through the membranes.

Complete rupture of the cord is much more frequent than that of individual vessels. It usually complicates precipitate labor, less frequently obstetric operations, and is comparatively rare in spontaneous normal births.

Klein found in 283 precipitate labors 133 cases of rupture of the cord, or 47 per cent. Koch, in 37 precipitate labors, 16 per cent. of rupture of the cord. It is sometimes difficult to determine whether the cord was torn across or cut. If the fetus is of excessive size, injuries to the cord may occur, while the point of rupture may seem comparatively clean cut. The use of forceps, version, and extraction, or contracted pelvis extraction with short cord and forceps extraction with short cord, have all been accompanied by rupture, usually 0.5 cm. from the navel. Cases of rupture of the cord in spontaneous normal labor with the mother in the recumbent posture are rare. The cord is usually abnormally short or coiled about the fetus, or is the site of some anatomical abnormality. In most cases the cord ruptures during the period of active expulsion. In but 6 reported cases did rupture occur before the child was expelled.

In one case a mother pregnant eight months was kicked in the abdomen by a horse, causing laceration of the umbilical vein and death of the child before the beginning of labor.

In 14,639 labors in the Obstetric Clinic at Stockholm but 2 cases of rupture of the cord are reported. In the first case when the head of the child was born the cord was coiled about the neck. Before it could be loosened the child was expelled during a very strong uterine contraction, accompanied by rupture of the cord. The child survived. Neither mother nor child had any sign of syphilis, and the cord was normal upon macroscopic examination.

The second case was one of normal pelvis with transverse position, with gradual descent of the fetus. The back was first directed toward the right and then anteriorly. The birth of the right shoulder and arm preceded that of the head. The umbilical cord was found ruptured

[1] Archiv f. Gynäkologie, 1907, Band lxxxiv, Heft 1.

42 cm. from the umbilicus. During the entire labor the fetal heart sounds were good. The child survived but was at birth slightly asphyxiated. It was above the average in size and weight. The placenta was expelled ten minutes afterward and was normal. With the placenta came the remaining portion of the cord, 11 cm. in length, with eccentric insertion. The entire length of the cord was 53 cm. For about 2 cm. in length the cord was especially thin, the connective tissue and jelly of Wharton being absent, so that the cord consisted of the bloodvessels only. At this point rupture had occurred. Microscopic examination of the cord in this case confirmed the macroscopic appearances, showing a lack of connective tissue in the walls of the vessels and in the elastic membrane covering the vein at the point of rupture.

The normal umbilical cord has a resistance and elasticity which enables it to withstand considerable tension without rupture.

THE PUERPERAL PERIOD.

The Surgical Management of the Puerperal Period is the title of a paper by Flint,[1] read before the Obstetrical Society of New York.

He draws attention to the necessity of cleansing the hands freshly, or putting on fresh gloves after the birth of the child, while waiting for the expulsion or expression of the placenta. He believes that a hot sterile salt solution, or bichloride douche, should be used immediately after labor. If the douche be given very hot the blood clots are washed away, oozing is checked, and the tissues are in a condition favorable for examination.

Lacerations of the perineum and pelvic floor should be immediately closed. When slight tears of the vagina, mucous membrane, or fourchette occur they can be sutured before the birth of the placenta with twenty-day chromic catgut, but the stitches should not be tied until after the placenta is expelled. Lacerations or abrasions of the vulva, labia, or vestibule should always be looked for. The latter is usually accompanied by sharp bleeding. This is readily controlled by deep sutures, care being taken to avoid the urethra.

In repairing lacerations of the perineum, proper care should be taken to place the sutures deeply enough and carry them well out of either side to unite the edges of the muscles. A heavy plain catgut suture may be buried in the tear in such a way as to bring the muscles upward and toward the median line. Ordinarily stitches of chromic catgut or silkworm catgut will then easily catch and hold the deeper structures for a permanent union. The sutures should be tied loosely to permit the swelling which usually occurs during the first few days of the puerperal

[1] American Journal of Obstetrics, January, 1908.

period. Where the conditions are not favorable for immediate repair, the operation may be performed upon the following day, with the advantage of all needed appliances.

As regards lacerations of the cervix, in many cases the immediate operation can easily be performed, but occasionally it is difficult. Swelling and bruises of the tissues immediately after labor make the prognosis uncertain. Stitches improperly placed may interfere with the lochia, causing retention. The routine performance of this operation is considered inadvisable. When, however, the cervix is torn sufficiently to cause active hemorrhage, one or two plain catgut stitches placed in the angle of the torn cervix will best stop the bleeding. Tears in the anterior vaginal wall must frequently result from the projecting blades of the forceps. Such should be immediately repaired.

Surgical dressings should be employed in all cases. Vaginal douches should be omitted, but the vulva should be irrigated after each evacuation of the bladder when the dressings are changed. The catheter should be used only when necessary, and absolute cleanliness should invariably be practised. The puerperal period is a time when infection is likely to occur. As an adjunct to the use of dressings the obstetric binder is valuable.

Where hemorrhage complicates the puerperal period the uterus must be emptied. If possible, a digital examination should first be made, followed by the use of a large blunt curette. An intra-uterine douche of hot sterile salt solution should be used. Where hemorrhage occurs late in the puerperal period the use of the curette is indicated. Should the scrapings indicate chorio-epithelioma, hysterectomy should immediately follow.

An examination at the end of the fourth or sixth week should be made to determine the presence of subinvolution and displacement. When the uterus is too large tampons of boroglycerin or tannic acid and glycerin give excellent results. Strychnine and ergotin internally, and hot douches, should also be used. Where backward displacement of the uterus occurs in the puerperal period the cause for such a condition may be difficult to determine.

Flint believes that constipation and straining in defecation are the most frequent cause of uterine displacements. Laxative medicines should be used, and the patient should not be allowed to strain, but should be relieved by enema. The patient should also lie flat on the abdomen for ten or fifteen minutes twice each twenty-four hours during the latter part of the puerperal period. The knee-chest position is also of advantage. When a backward displacement is first observed, six weeks after labor, the uterus should be replaced and a pessary inserted. A simple ring is easily introduced and is usually efficient. This should be worn for two or three months, and in 80 per cent. of cases the position of the uterus remains normal after the pessary is removed. At least two

examinations should be made in these cases after the removal of the pessary. Occasionally it is necessary to continue the treatment for six months.

McDonald[1] reports his investigations of 48 *perineal lacerations.* The average weight of the child was 3300 gm.; the average occipital frontal diameter 11.4 cm. There were 21 cases of lacerations not involving the muscle, and 27 cases in which the muscle was injured. When the weight of the child and the size of the head were above the normal the muscle was most readily injured.

As regards the forceps, the writer believes that the solid blade forceps of the type of the Tucker-McLain model are the least apt to cause injury to the perineum. If the head remains upon the perineum without advance for more than one and a half hours, the liability to rupture is greater, and the difficulty of securing union by stitches is also much increased. When the occiput rotates posteriorly the solid blade forceps should be used to turn the occiput to the front. Where scar tissue is present in the perineal ring lacerations readily occur. The shoulders tend rather to increase lacerations made by the head than to cause lacerations. Extensive injury to the muscles of the pelvic floor and supports of the pelvis may occur without rupture of the skin surface. Lacerations of the sphincter can usually be avoided. Laceration of the anterior portion of the perineal ring occurred in 32 of the 48 cases. Most lacerations are lateral, and those of the anterior vaginal region are usually accompanied with hemorrhage. Tears should immediately be closed, as operation in the stage of granulation is dangerous. Freshening granulating surfaces may cause absorption and open the avenues of infection. Where the sphincter was torn the rectum was first closed by fine chromic catgut and a small needle. The stitches should not pass into the mucous membrane of the bowel. If the sphincter is to be brought together the muscles should be closed by two sutures of fine chromic catgut. As a rule, twelve-day chromic catgut is used for suturing the mucous membrane of the vagina. For closing the tears of the skin surface, silkworm catgut is employed.

Attention is called to closing a gap or pocket often left between the line of skin sutures and the sutures which repair the lateral lacerations of the pelvic floor. This gap often forms a pocket, leading to retention of lochia, which should be closed by stitches of chromicized catgut. Good union was obtained in these cases, with the exception of one in which plain catgut was used, where separation and infection of the vaginal portion of the wound occurred.

The after-treatment consists in keeping the patient in bed for ten days without douches. Silkworm-catgut stitches were removed in from ten to fourteen days, and patients were often allowed to get out of bed before the removal of the sutures.

[1] Surgery, Gynecology, and Obstetrics, January, 1908.

I desire to call attention to the importance of closing considerable lacerations of the cervix immediately after delivery by operation, while the patient is anesthetized, or before she completely recovers from the anesthetic. A thorough examination should be made to find the location of the tear, how far it extends toward the vaginal junction, and whether the pelvic floor is also torn high up near the cervix. Every effort should be made to pass one or two stitches through the torn tissue at the highest point. In the cervix these stitches control hemorrhage greatly facilitate the closure of the cervix, and do not interfere with the discharge of lochia. In the pelvic floor, high stitches carried deeply bring together fascia, which is most important in maintaining a backward position of the cervix, and avoiding retroversion. I have several times succeeded in unfavorable cases, where the tissues were bruised and swollen, by this method. In cases of precipitate labor, or where labor is terminated by dilatation with Bossi's dilator, or with the hands, followed by forceps' extraction or version, the cervix is usually not greatly swollen, its tears present clean edges, and the conditions are favorable for suture.

In closing the pelvic floor care must be taken not to carry these sutures too far up the perineum toward the skin surface. The posterior wall of the vagina must thus be shortened and pulled downward, and a tendency to rectocele or retroversion be established. Laceration of the anterior segment of the pelvic floor should not be neglected, and in my experience occurs as frequently as those of the posterior segment. They should immediately be closed with fine chromicized catgut. Lateral tears of the vagina should invariably be closed, and should be sought for in severe cases. For several years I have made it a rule in hospital cases to close considerable lacerations of the cervix immediately, and all lacerations of both segments of the pelvic floor, perineum, and vaginal walls. No case of infection has been traced to this source, and the results have been good. In private practice the same course has been followed, with the exception that in patients undoubtedly clean and of good constitution, small lacerations of the cervix are allowed to heal spontaneously.

Puerperal Septic Infection. Brenner[1] reports a very interesting case of puerperal sepsis of unusual character. The patient was a primipara aged nineteen years, who had a normal labor. On the third day after delivery the temperature rose to 104°, the patient had some pain in the breast but none in the abdomen, the uterus was a hand's breadth beneath the umbilicus and well contracted. Upon the vaginal portion of the cervix there were several ulcers and lacerations around the os uteri. The temperature fell to normal, but this was succeeded by chills and fever. Bronchitis gradually developed, the abdomen remaining free from pain. The lochial discharge ceased almost entirely, and what remained

[1] Monatsschrift f. Geburtshülfe und Gynäkologie, 1907, Band xxv, Heft 1.

was without odor. Three weeks after labor the uterus was well involuted, but both parametria were infiltrated. The high temperature and chills continued. About eight days before death the patient was apparently very much better. The temperature was lower, the chills were less frequent, she was taking nourishment better, but this improvement was only temporary.

Autopsy revealed a very much enlarged and softened spleen with three anemic infarcts which must have been in the spleen for at least two weeks. There was also an endocarditis at the mitral orifice, the liver and kidneys were enlarged, and the epithelia showed cloudy swelling. All of the viscera were exceedingly anemic. In the inferior vena cava were found thrombi, there were thrombi in other veins more or less recent, the uterus was well contracted and apparently normal, while both lungs showed the presence of thrombi and areas of beginning gangrene.

Surgical Treatment of Puerperal Fever. Sinclair[1] writes at considerable length upon the surgical treatment of puerperal fever. He believes in curetting, and describes the manner in which he performs this operation. He uses a sharp curette. He believes that the fear of perforation of the uterus is very much exaggerated, and that the uterine wall is usually so thick that it would be difficult to perforate it with the ordinary method of performing the operation. After curetting the uterus is irrigated, and then the uterine cavity is thoroughly swabbed out with sublimate solution. He has also found good results from the free administration of normal salt solution by the bowel. The patient is further encouraged to drink large quantities of water. He describes five cases of puerperal sepsis, illustrating the points made.

Sinclair believes that occasionally vaginal hysterectomy is indicated in puerperal sepsis, but that in most patients other operations should be selected. Ligation of thrombosed veins for puerperal pyemia has been successfully performed in a number of cases, and he urges its further trial. He believes that flushing and drainage of the abdomen by abdominal section are exceedingly valuable in many cases. In other cases he opens the posterior vaginal vault for drainage and inserts a gauze packing, which is left for twenty-four hours.

There can be no question concerning the value of drainage from the abdomen through the vagina in puerperal sepsis. I have repeatedly practised the following operation with good results:

After a preliminary curetting and cleansing of the uterine cavity the abdomen is opened and the uterus, tubes, and ovaries are thoroughly inspected. Adhesions which yield to pressure by the fingers are broken up and the uterus, tubes, and ovaries, if dislocated, are placed as nearly as possible in their normal position. The pelvic cavity is then filled with normal salt solution. The posterior vault of the vagina is opened

[1] Surgery, Gynecology, and Obstetrics, November, 1907.

and 10 per cent. iodoform gauze is packed into the pelvic cavity, supporting and maintaining the pelvic viscera in normal position, while the end of the gauze passes into the vagina through the opening made.

The abdomen is then entirely closed, after salt solution has been freely poured into the abdominal cavity. The patient is placed with the shoulders slightly elevated and is made to drink water freely, and salt solution is also introduced into the bowel, and if necessary beneath the skin.

The gauze is gradually removed through the vagina until all has been extracted, within six or seven days after the operation. After the gauze has been removed, it is usually best to have the patient receive douches of lysol, 1 per cent., for several days. In my experience, this operation has taken the place of hysterectomy, and has been attended with most satisfactory results.

A discussion of the operative treatment of puerperal septic infection should not mention the matter of incision and drainage without referring to the operation of the late Dr. Pryor. It will be remembered that this operation consisted in free opening of the posterior cul-de-sac, the breaking up of adhesions, or the removal of a pyosalpinx. The pelvic tissues were carefully palpated and as far as possible replaced in their normal position, and retained by packing with a broad strip of iodoform, 10 per cent. gauze. Within forty-eight hours after operation traces of iodine could be recognized in the urine. The gauze was gradually removed and the wound which remained was cleansed by antiseptic douches.

The Transfusion of Blood in Puerperal Sepsis has been tried by McKay.[1] His patient was a primipara who had been prematurely delivered at seven months. The placenta did not come away spontaneously, and the physician in attendance introduced the hand and fingers for its removal. A few days later he curetted the uterus.

After admission to the hospital antistreptococcic serum was used in alternation with diphtheria antitoxin. As no improvement followed, the patient was examined under ether, when the uterus was found empty and a streptococcus infection present. On the fourth day after admission to the hospital the patient began to have chills. She was then treated by intravenous transfusion with blood and salt solution. On one occasion salt solution and one ounce of peroxide of hydrogen was introduced. The result was a very severe rigor. Under the transfusion of blood and salt solution the patient improved steadily until she became sufficiently strong to sit up in bed supported by a bedrest. In this posture on one occasion she fainted, and almost immediately died. An autopsy could not be obtained.

[1] American Journal of Obstetrics, October, 1907.

Ophthalmia Neonatorum. Cragin[1] describes five methods of prophylactic treatment employed at the Sloane Maternity in 1000 confinements. The smallest number of cases of ophthalmia was 17, the largest 34. The eyes are cleansed carefully with boric acid solution, and in 1000 confinements a 2 per cent. solution of nitrate of silver was employed. There were 18 cases of ophthalmia without the loss of an eye and with no opacities. In another 1000 cases, 1 per cent. nitrate of silver solution was employed, with 34 cases of ophthalmia, the loss of one eye, and no opacities. In a third series, 5 per cent. protargol was employed, with 53 cases of ophthalmia, the loss of one eye, and one opacity. In the fourth series, 10 per cent argyrol was used, with 34 cases of ophthalmia, the loss of one eye, and two opacities. In the fifth series, 20 per cent. argyrol was employed. There were 43 cases of ophthalmia without the loss of an eye, and without opacity.

Cragin has treated active infection in the eyes with irrigations of boric acid solution, every fifteen to twenty-five minutes; cold compresses and the installation of argyrol, 30 per cent., every two to four hours. His results have been good.

The Membranes. Bollenhagen[2] reports 7 cases of retention of the fetal membranes. In some of these hemorrhage occurred at labor; in others there was a continuance of foul lochia; and in others a persistent reddish discharge during the puerperal period. These conditions ceased promptly when the membranes were removed, and the uterus was irrigated once with an antiseptic solution.

Attention is called to the fact that retention of the membranes may be quite as important as retention of a portion of the placenta.

Calliri[3] has contributed a paper upon the influence of premature rupture of the membranes upon the puerperal period, quoting statistics from cases collected. His conclusions are that premature rupture of the membranes does not in itself aggravate or disturb the course of the puerperal period if the rupture be spontaneous and labor be carefully conducted. If the morbidity of these cases seems greater than those of some others, it is because some abnormal condition exists which favored the premature rupture of the membranes. The duration of labor does not seem to be greatly influenced by this occurrence.

The Treatment of Mastitis by Bier's Method.[4] Paul, in Leopold's clinic at Dresden, reports his results in the treatment of 10 cases of mastitis; 8 of these cases were interstitial, parenchymatous mastitis, and 2 were those of infection in the milk ducts; 4 of the 8 were treated by Bier's method of securing congestion, and 4 without.

[1] Surgery, Gynecology, and Obstetrics, August, 1907.
[2] Zentralblatt f. Gynäkologie, 1907, No. 5.
[3] Annali di Ostetricia e. Ginecologia, 1907, No. 2.
[4] Zentralblatt f. Gynäkologie, 1907, No. 24.

In the cases of infection of the milk ducts, one was treated by this method; in the 4 that were treated without the employment of this method, it was necessary to practice incision at intervals varying from the second to the seventh day after the appearance of the first symptoms. In the 4 cases treated by Bier's method good results followed. In the other 2 cases, one was treated by incision only, making a very tedious recovery. The other had multiple incisions with the production of congestion or venous stasis, and made a much more rapid and satisfactory recovery. Two cases are also described which were not those of mastitis proper, but of phlegmonous inflammation resembling mastitis. These were treated by Bier's method with incision, with good results.

In summing up his observations, Paul finds that 4 cases of mastitis and 1 of phlegmon were successfully terminated in two days by Bier's method without incision. In one case of infection of the milk ducts and one of phlegmonous inflammation the incisions exercised a most favorable influence, and the methods of producing congestion seemed to be of great assistance.

The method is briefly described as follows: In mastitis the ball of the breast pump is applied, and its diameter is from 2 to 4 cm. smaller than that of the glands of the breast. The ball is sterilized, the nipple is cleansed, the ball is applied, and a vacuum very slowly created by a colpeurynter syringe. When pain is felt at the border, the manipulation ceases. The breast becomes dark blue in color, cyanotic in appearance, and the edges of the wound frequently bleed, which does no harm. The apparatus is allowed to remain for five minutes, and manipulation is repeated from two to five minutes—in all fifteen minutes being utilized. It is sometimes well to extract from the milk ducts retained milk after this manipulation. Compresses of alcohol, or wet compresses, are then applied. The treatment is repeated, in accordance with the severity of the case, but usually not more frequently than twice daily.

DISEASES OF THE NERVOUS SYSTEM.

By WILLIAM G. SPILLER, M.D.

DISEASES OF THE BRAIN.

Brain Tumor. Nonne reports 4 cases of endothelioma or fibro-endothelioma growing from the *cerebral dura.* They were not diagnosticated and not operated upon, and he regrets that removal was not attempted, as it would not have been difficult. I have observed 3 cases of this kind, all with operation, and the chief difficulty in the removal of these growths has seemed to me to be the hemorrhage that occurs at operation. In another case Nonne[1] diagnosticated cerebral tumor, but the necropsy showed a hematoma between the pia and dura. He is inclined to believe that operation in such a case might be of great benefit. I have thought of this possibility in 2 cases that have come under my observation, but I know of no instance in which operation has resulted in the removal of an internal hemorrhagic pachymeningitis, and the difficulties of operation seem considerable, chief of which is the uncertainty of diagnosis. In another case with the symptoms of brain tumor or serous meningitis a tuberculous abscess of the occipital lobe was found. No cause for brain abscess was detected, and there had not been changes of temperature, chill, acute onset, or exacerbations, and choked disks were of high grade. The latter are regarded as uncommon in brain abscess, but they were present in a case reported by Dr. Mills and myself. In another case an abscess of the frontal lobe, with choked disks, had its origin in otitis media. The implication of the frontal lobe from ear disease is very rare. Nonne reports, in addition, 9 cases of *pseudotumor,* in which the symptoms of tumor were found, although no tumors were present.

An exceedingly interesting case of brain tumor is reported by Stertz.[2] Symptoms of a tumor of the motor region had been present eight years. Operation revealed nothing, and even when the brain was examined by the naked eye at the necropsy a tumor could not be found. The brain showed nothing abnormal on its external surface, except that the left hemisphere was a little larger than the right, but the convolutions were not flattened. Frontal sections failed to reveal the tumor, although a small area of softening was discovered, and a glioma was found by

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 5 und 6, p. 317.

[2] Neurologisches Centralblatt, May 1, 1907, p. 393.

microscopic examination. The author would have us very careful in making the diagnosis of pseudotumor without microscopic study, as in such a case as he described had a portion of brain a little remote from the diseased area been examined the tumor would not have been detected, and the case would have been regarded as one with the symptoms of tumor without the actual lesion. *Gliomata* are infiltrating, but their presence can usually be detected with the naked eye. Such a case as Stertz reports is, therefore, exceptional.

The duration of the symptoms during eight years makes this case resemble closely the one reported by Dr. Martin and myself.

In the patient, who was under my[1] care, Jacksonian convulsions had been present about eight years, and at the necropsy a tumor 1.5 cm. by 1.5 cm., and 0.5 cm. from above downward, reaching to the surface of the brain, was found in the posterior end of the second frontal convolution. Operation was performed by Dr. Edward Martin, and although the proper region was exposed, the tumor was not removed because it was subcortical. In contrast with this case, in which the tumor, a glioma, remained small during many years, I may refer to a large glioma observed by Rosenblath which had produced symptoms only during a period of five weeks; or to a patient seen by me in consultation with Dr. McConnell, in whom symptoms of brain tumor had been present only about ix weeks, and yet at the necropsy a large glioma of one frontal lobe was found.

Jacksonian epilepsy, even without other symptoms, seems to be a sufficient indication for operation. We probably run less risk by operating than we do by permitting the convulsions to continue without surgical intervention. Occasionally status hemi-epilepticus may occur without organic lesion, as emphasized by Müller, Nonne, and Bernhardt, and in such cases operation would probably be useless. It is very true that convulsions limited to certain muscles, as in Jacksonian epilepsy, may occur as a manifestation of idiopathic epilepsy; but it is also true, as Bychowski[2] remarks, that when limited convulsions occur in idiopathic epilepsy they will be associated occasionally with attacks of some other type or with general convulsions. This I have observed, and it has seemed to me very important in making a diagnosis when convulsions of the Jacksonian type occur. Absence of Babinski's and Oppenheim's reflex, with paralysis and convulsions of one side, Bychowski regards as characteristic of intracranial but extracerebral tumor. I have failed to get Babinski's reflex in certain cases in which I felt sure that the central motor tracts were affected. The absence of this sign has seemed to me of less diagnostic value than its presence.

Bychowski refers to disturbance of micturition occurring from a cerebral lesion, and gives numerous references to the literature. This

[1] Review of Neurology and Psychiatry, June, 1907, p. 433.

[2] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 1 und 2, p. 53.

subject is treated more at length by Minkowski,[1] in the same number of the journal in which Bychowski's paper appears. There is sufficient evidence to warrant the statement that cerebral lesions may cause disturbances of micturition, but usually they are slight and transitory.

The glioma observed by Hochhaus[2] is remarkable because it extended through the entire right cerebral hemisphere, right cerebral peduncle, and almost to the decussation of the pyramids; and also because two other distinct gliomata were found in the brain. The existence of multiple gliomata is disputed. Borst says no such case has been reported, Oppenheim regards the condition as very rare, and Gowers reports a case. Hochhaus' case is interesting also, because it is one of those in which inunctions of mercury caused great improvement, although the symptoms were the result of glioma.

In the interesting case reported by Thomas and Cushing[3] the *preservation of sensation* is considered remarkable, as the lesion was in large part in the postcentral convolution and involved a considerable portion of its superior part. A tumor was assumed to be present, but a cyst was found. This very absence of important symptoms would be more likely to occur with a slowly developing cyst pushing the nerve fibers apart and not infiltrating—just as in internal hydrocephalus, even of great intensity, the symptoms often are not proportional to the lesion—than a tumor which has a more rapid growth, even if infiltrative, and destroying more brain tissue. I am unable to understand why it should be necessary to assume that a cyst of the brain is the result of a degenerated glioma, and why a cyst may not exist as such from the beginning. We have cavities in the cord frequently, syringomyelia, and their origin in glioma is disputed, although they probably are so formed occasionally. It is very hard to understand how a large glioma may so entirely disappear that no evidence of its infiltration in the surrounding brain tissue is obtainable.

The value of this case, as the authors emphasize, lies chiefly in the fact that it demonstrates that both dura and brain may be manipulated without causing any pain to the thoroughly conscious patient. This is indeed important. Cushing found that only when the dura was put under tension or displaced was any discomfort occasioned, otherwise it seemed to be absolutely free from sensitiveness. He has had the opportunity to test his conclusions in a second case with similar results. These findings may greatly modify operative procedure.

Serous Meningitis Simulating Brain Tumor. A very extraordinary case of circumscribed serous meningitis is reported by Placzek and Krause.[4] The symptoms were those of a tumor of the *posterior*

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 1 und 2, p. 127.
[2] Ibid., vol. xxxiv, Nrs. 3 und 4, p. 185.
[3] Journal of the American Medical Association, March 14, 1908, p. 847.
[4] Berliner klin. Wochenschrift, July 22, 1907, p. 911.

cranial fossa. Placzek shows that too much dependence cannot be put on the absence of choked disks as indicative of tumor of the pons, when the symptoms point to a tumor of the posterior cranial fossa; although Oppenheim has laid much stress upon this as a sign. When a collection of fluid was found at the operation on the under surface of the right cerebellar hemisphere, it seemed probable that a tumor was concealed somewhere, but none could be discovered. Improvement began soon after the operation, and later recovery occurred. A persistent and marked rise in temperature with rapid pulse and rapid respiration was difficult to explain; it seemed probable that it was caused by the manipulation during the operation. The condition is described by the authors as circumscribed adhesive cerebral arachnitis. Unfortunately, it is seldom the lesion when symptoms of brain tumor exist, but it is possible that some of the cases of pseudotumor with recovery without operation may be caused by this cystic formation.

Hydrocephalus with Symptoms of Brain Tumor. It is important to remember that hydrocephalus may give focal symptoms like those of brain tumor. In a case observed by Oppenheim[1] general symptoms of increased intracranial pressure were present, but in addition there were acoustic symptoms on one side, tinnitus in the right ear, and in the left lower limb slight spasticity, ankle clonus, and Babinski's reflex. The diagnosis of tumor of the posterior fossa on the right side was made, but no tumor was found at operation, and only hydrocephalus was revealed by a postmortem examination.

Brain Tumor and Hemicraniosis. By the term hemicraniosis, Brissaud and Lereboullet describe an hypertrophy localized exclusively to a half of the cranium including the face. They report two cases, one of which was with necropsy, and in this case tumor of the brain was found. In the other case epileptic convulsions occurred, so that a tumor may have been present in that also. In both these cases there was frontoparietal and supra-orbital hyperostosis, and in one a slight implication of the face. The dura is supposed by its outer surface to cause proliferation of the bone, and by its inner surface the formation of tumors. Two other cases with necropsy have been reported, and in each a tumor of the brain was found. I[2] record two cases of hemicraniosis; the notes of one of these were read before a medical society in 1899. In both endothelioma growing from the dura and pressing against the brain was found, and in one case operation was so successful that all symptoms disappeared; in the other operation was fatal from hemorrhage. It is true that recurrence occurred in the successfully operated case, but the new tumor was removed without difficulty, and the patient is doing very well (July, 1908). Cases of actual cure from operation are uncommon;

[1] Berliner klin. Wochenschrift, September 2, 1907, p. 1122.

[2] Journal of the American Medical Association, December 21, 1907, p. 2059.

the tumor may be removed, but usually recurrence occurs, and almost invariably the patient is left more or less decrepit.

The presence of brain tumor in 5 cases of hemicraniosis should indicate that any pronounced local thickening of the cranium is likely to be associated with a tumor growing from the dura, and operation should be attempted as soon as cerebral symptoms become manifest. It may then be possible to remove the tumor while it is still small. The local thickening of bone is usually over or near the motor area of the brain, so that the symptom complex is distinct, and the tumor growing from the dura is not likely to infiltrate the brain. Operations on dural tumors unfortunately are often very bloody, because of the vascularity of the parts, and possibly should be done in two stages.

Brain Tumor with Laryngeal Symptoms. The case reported by Atlee and Mills[1] is interesting chiefly in the occurrence of laryngeal paralysis apparently from a brain tumor. The symptoms indicated a tumor of the lower part of the right motor area and parietal lobe, and the growth was found here at operation and removed. The authors are guarded in attributing the laryngeal paralysis to the cerebral lesion. The paralysis had all the features of a unilateral peripheral recurrent laryngeal affection. The patient's voice, which had disappeared entirely, recovered considerably after the removal of the cerebral tumor. The authors refer to the literature bearing on the cerebral centres of the larynx, and conclude that unilateral irritation of the cortical centre for movements of the larynx should cause bilateral symptoms, and a destruction of this centre on one side could produce bilateral paralysis of the vocal cords. The clinical case of Delavan and the laryngeal findings both before and after operation in their own case, they think, point to the possibility of a destructive lesion of the cerebral centre for laryngeal movements producing a persistent unilateral paralysis of the vocal cord on the side opposite to the lesion.

Tumor of the Hypophysis. Tumors of the hypophysis are so deeply situated that they have been regarded as inoperable, although Horsley has had exceptional success. The subject of tumors of this region is receiving much attention at the present time. Schuster[2] reports a case in which he was able to demonstrate alteration of the sella turcica from tumor by means of the *x*-rays, and Löwe[3] describes how the approach to the base of the brain may be practicable through the nose. The dangers of too great discharge of cerebrospinal fluid and of infection need not be dreaded; it is improbable that the cerebrospinal fluid would escape in such amounts as to endanger life. Infection of the meninges is rendered less likely because the secretion is free, and stagnation with resorption of toxins does not occur. A tumor of the hypophysis success-

[1] Journal of the American Medical Association, December 28, 1907, p. 2129.

[2] Neurologisches Centralblatt, Septemper 16, 1907, p. 841.

[3] Ibid., p. 842.

fully removed through the nasal route has been reported by Schloffer.[1] In a later paper[2] he states that the patient died two and a half months after the operation, and the tumor was found to be much larger than they had supposed it to be.

The successful removal of a tumor of the hypophysis through the nose is reported by v. Eiselsberg and v. Frankl-Hochwart.[3] The operation was performed on June 21, 1907, and on September 7, 1907, the examination showed marked improvement in vision and the patient felt well. As the tumor probably was a carcinoma recurrence is to be feared.

Cerebellar Tumor. Oppenheim,[4] in a discussion at a meeting of the Berlin Society for Psychiatry and Neurology, stated that usually no dependence could be placed upon swaying to one side in cases of tumor of the cerebellum. In a small number of cases the swaying is toward the side of the tumor. He has not been able to accept the statement that weakness occurs on the same side as the cerebellar tumor, but he does believe that disease of one side of the cerebellum, and especially of the inferior cerebellar peduncle, causes homolateral ataxia. He has shown that serous meningitis may produce the symptom complex of tumor of the cerebellopontile angle in every detail. Tumor of the pons usually does not cause choked disks, and the presence or absence of this sign may be the only means of diagnosticating between tumor outside of the pons and tumor within the pons. When a tumor grows toward the fourth ventricle, so as to cause hydrocephalus, it may give rise to choked disks. I may add that in such a case we are likely to find paralysis of lateral associated ocular movements.

Bernhardt[5] refers to paresthesia of one side of the tongue, especially of its anterior portion, as a sign of tumor of the cerebellopontile angle. The sign has also been mentioned by Bruns.

Siemerling[6] has found that the disturbance of the corneal reflex which Oppenheim has regarded as of much importance in cerebellar tumors is capable of variation, and is not necessarily persistent and progressive, as Kempner believes. The disturbance of the corneal reflex must be from distant pressure of the tumor, and therefore is liable to variations in intensity, but it is always on the same side as the tumor; or if bilateral impairment is present, it is greater on the side of the tumor. It is, therefore, a sign of very great value to determine the side of the lesion, but must be searched for repeatedly, and occasionally may be found when the tumor is not in the cerebellum.

The ataxic, tremor-like movements of the extremities have a decided

[1] Wiener klin. Wochenschrift, 1907, No. 21.
[2] Ibid., September 5, 1907, p. 1075.
[3] Neurologisches Centralblatt, November 1, 1907, p. 994.
[4] Archiv f. Psychiatrie, vol. xliii, Nr. 2, p. 875.
[5] Ibid., p. 882.
[6] Berliner klin. Wochenschrift, April 6, 1908.

importance in the symptomatology of cerebellar tumors, and occur on the side of the lesion, and are more intense in the upper limb. Homolateral paresis of the limbs is a rare sign of cerebellar tumor and of value only when a distinct atonic unilateral paralysis exists.

Siemerling has never seen unpleasant complications in lumbar puncture in cases of brain tumor, provided certain precautions are taken. The flow should be stopped at once when the pressure falls quickly and markedly or when severe headache occurs. When lumbar puncture cannot be performed puncture of the ventricles may be useful in making further operations possible.

Cases of death following lumbar puncture, where tumor of the brain has been present, have occurred frequently enough to show the danger of puncture; and this termination may result when only a small amount of fluid is withdrawn, as shown by Lapersonne and Cerise.[1] It is a procedure therefore, to be regarded as dangerous if brain tumor exists.

The side toward which the patient falls, in Siemerling's opinion, is unreliable in determining the site of the tumor.

Aspiration of Tissue for Diagnosis in Brain Tumor. The idea of boring a small hole in the skull and then, by puncturing the dura, removing a portion of a tumor for microscopic examination is not altogether new; but this subject has been very carefully and thoroughly considered recently by Pfeifer. His technique should be read in his paper by anyone desiring to adopt the method. Pfeifer[2] gives his results obtained from a large number of cases (20). In some instances the needle contained no tissue in spite of the repeated aspiration, and sometimes it contained normal brain tissue, but in a considerable number of cases (9) tumor was diagnosticated, and the diagnosis was confirmed by operation or necropsy. Softening was diagnosticated in 5 cases. Blood elements were obtained in 18 cases. The microscopic findings were negative in 5 out of 20 cases; in others the interpretation of the findings caused some difficulty. It was possible in some cases to determine the extent of a tumor by observing the character of the tissue removed by punctures in different regions of the brain. Brain puncture is said to be relatively harmless, and is to be employed to confirm the clinical diagnosis of brain tumor; it has also therapeutic value in the emptying of cysts and diminishing the amount of fluid in the ventricles. General anesthesia is not necessary nor desirable, but the place of operation is made insensitive by means of ethyl chloride. This article by Pfeifer is long, and exhausts the subject as fully as possible at the present time.

Neisser,[3] by brain puncture, has determined the existence of extradural hemorrhage; by removal of 180 c.c. of old blood from the posterior cranial fossa has restored an almost dead man to consciousness and later to

[1] Revue Neurologique, May 30, 1907, p. 517.

[2] Archiv f. Psychiatrie, vol. xlii, Nr. 2, p. 451.

[3] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiv, Nr. 1, p. 6.

health; by the removal of a small quantity of bloody serum has induced recovery without further operation, and in other cases has removed the suspicion of meningeal hemorrhage. The method has been of use in cysts of the brain; in one case 250 grams of fluid were removed by seven punctures, and gradually the cyst became smaller and recovery occurred. Brain puncture is the only clinical means of making a diagnosis between brain tumor and cyst. The method has been of much value in the diagnosis of tumors both in determining the position as well as the character of the growth. It is not always easy to recognize the character of the growth from the small amount of tissue obtained, but it may be diagnosticated as tumor tissue if such it be. When tumor is suspected and no characteristic tissue is obtained the puncture should be repeated. The tumor may be so deep in the brain that the needle is unable to reach it. The puncture is useful in brain abscess; also in hydrocephalus. When fluid is obtained at a depth less than 3 cm. hydrocephalus may be suspected, although it cannot be determined whether it is a primary hydrocephalus or secondary to brain tumor. Where lumbar puncture cannot be performed, as in very fat people or where bedsores prevent it, puncture of the ventricles may be of service. Brain puncture is useful as a palliative measure for inoperable tumors. The report of Neisser seems to indicate that in brain puncture we may have a most desirable method for diagnosis and treatment, but it may be wise to await the results of further observation before we form definite opinions. The method will unquestionably meet with severe criticism. The technique is given by Neisser.

Auerbach is not very enthusiastic as regards brain puncture. He refers to a case mentioned by Pfeifer in which an artery was punctured and death occurred. In a few cases particles of bone have been carried into the brain. Some surgeons, especially Krause and Borchardt, are opposed to it, and some prefer to make a small trephine opening 0.5 cm. before performing the puncture. The advantages of this method are: Several punctures in different directions can be made from the same opening in the bone, displacement of fragments of bone is improbable, a large dural vessel is not likely to be injured, the presence of extradural fluid and the pulsation of the dura can be determined, and the instrument for puncture may be larger and more material may be obtained. Oppenheim[1] has found brain puncture of much service, but it must not be repeated often, and it has seemed to him to make the brain less resistant to a radical operation.

Tumor of the Cerebellopontile Angle. Operations on tumors situated at this portion of the brain have usually proved fatal, or if not fatal the patient has usually been very little if at all benefited by them. I have seen quite a number of cases in which attempts by different surgeons

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiv, No. 1.

to remove a tumor from this angle have been far from successful. It is, therefore, most encouraging to read the report of two cases by Oppenheim and Borchardt,[1] successfully treated surgically. The symptoms in the first case were headache, especially in the occipital region, vertigo, vomiting, nerve deafness in the right ear, cerebellar ataxia, bilateral choked disks, nystagmus, limitation of associated ocular movements toward the right, a reflexia of the right cornea, slight varying sensory disturbances in the right side of the face and in the territory of the right occipital major nerve, paresis of the right facial nerve with quantitative diminution of electrical response, paresis and hyporeflexia of the soft palate, and slight ataxic movements and adiadokokinesis in the right upper limb, less in the right lower limb. With such symptoms the diagnosis of tumor of the right cerebellopontile angle was not difficult, and a fibrosarcoma, the size of an egg, was found in this region. A portion of the right cerebellar hemisphere was removed. The operation was done in two stages, and two days after the removal of the tumor the patient's general condition was good. Improvement was gradual, and at the time of the report of the case, not quite eight months after the operations, the man was in good condition, he moved without ataxia, and did not have headache, vomiting, vertigo, paresthesia of the right side of the face, or choked disks; and, in short, seemed to be cured of almost every symptom.

In another case of tumor of the cerebellopontile angle reported by these authors very grave symptoms followed the removal of the tumor, and the patient was fed by the stomach tube for more than a week. Gradually these grave symptoms disappeared, and the condition was much improved.

Borchardt remarks that the removal of a considerable portion of one cerebellar lobe does not cause very serious persistent symptoms, and this statement is in agreement with my own observation made in cases in which Dr. Frazier and I have been associated. Borchardt has performed the operation for removal of a tumor of the cerebellopontile angle six times, and three of his patients are still living. I am convinced, however, that anyone will be seriously disappointed if he imagine that improvement is to be obtained in half of the cases operated upon; indeed, I regard the attempt to remove a tumor of the cerebellopontile angle as one of the most serious in cerebral surgery.

An excellent presentation of the symptomatology of tumors of the cerebellopontile angle has been given recently by Weisenburg.[2] He reports 5 cases, in 2 of which a tumor growing from the dura covering the petrous portion of the temporal bone and the occipital bone gave some of the symptoms of a lesion in the cerebellopontile angle, to such a degree, indeed, that an operation was performed in one of the cases.

[1] Berliner klin. Wochenschrift, July 15, 1907, p. 875.

[2] Journal of the American Medical Association, April 18, 1908, p. 1251.

In the third case there was entire absence of headache, nausea, vomiting, vertigo, and choked disks, and yet sufficient symptoms were present to suggest a lesion of the cerebellopontile angle. A cyst was found at operation, and its contents were removed. The incoördinate gait, ataxia, vertigo, and pains disappeared, deafness gradually diminished, but slight weakness of the left sixth and seventh nerves persisted. Vertigo was experienced by the patient when his eyes were turned toward the side of the lesion. A fourth case was one of abscess of the pia simulating the symptoms of a tumor of the cerebellopontile angle. I have already referred to this case in my paper on brain abscess. The fifth case was one of tumor of the fourth ventricle, compressing the inferior vermis and giving the symptoms of a tumor of the angle.

Aphasia. James Hinshelwood[1] has reported 12 cases of *congenital word blindness.* The first case of the congenital form was recorded by W. Pringle Morgan in 1896. C. J. Thomas, in 1905, called special attention to the fact that congenital word blindness may assume a family type and that an hereditary tendency is probable. Hinshelwood now reports the occurrence of this condition in four members of a family of eleven children. The education of the first seven members of the family was carried out in a normal manner, but the eighth, ninth, tenth, and eleventh children—all boys—experienced the greatest difficulty in learning to read, although in every other respect they seemed to be intelligent. Cases of congenital word blindness have occurred when glasses have been prescribed, in the belief that the disturbance was caused by some refractive error. In one case the difficulty did not extend to arithmetic; it could not, therefore, have been an optical one. Hinshelwood has shown that the visual memory for words and letters is completely independent of that for figures. The size of the type makes no difference, as it would do if the difficulty in reading were due to an ocular defect. In diagnosticating congenital word blindness it is important, as Hinshelwood states, to determine the mental condition of the patient, and to be certain that the inability to read is not the result of a general lack of intelligence. The defect is probably in the left angular gyrus in righ-handed people. Children afflicted in this way may nevertheless be taught to read; but with much perseverance, and Hinshelwood recommends that they should not be put into classes with other children.

Dejerine,[2] resuming the discussion on aphasia, remarks that until the present no cases are on record in which a lesion confined to the third frontal convolution and the subjacent white matter have been studied by serial microscopic sections; and to remedy this deficiency he reports two cases from his service in which the lesions were almost limited to the left third frontal convolution, and the external capsule was not implicated in the primary lesion. These cases seem to show, as Dejerine

[1] British Medical Journal, November 2, 1907, p. 1229.

[2] L'Encéphale, May, 1907, No. 5.

maintains, that a lesion of the area of Broca alone may cause motor aphasia, without alteration of the temporal lobe, the internal and external capsules, the central gray nuclei, or the motor convolutions. They therefore afford a very strong argument against Marie's views as presented in my digest of last year in PROGRESSIVE MEDICINE.

Dejerine attributes the disappearing of aphasia, even though the zone of speech may be seriously injured, to the functioning of the homologous convolution or to ambidexterity. The cases of Broca's aphasia reported by Marie are regarded by Dejerine as examples of total aphasia, with very grave disturbance of word seeing and word hearing. He maintains that in Broca's aphasia word deafness and word blindness are only temporary, lasting days or weeks, and disappear entirely later. He acknowledges that total aphasia may be caused by a lesion of Wernicke's zone. He suggests that Marie should not have used anarthria in reference to pure motor aphasia, as this term is employed for paralytic or spastic disturbances of speech, but should have used some such term as aphemia. He thinks the functions of the lenticular nucleus are entirely unknown and its connections very imperfectly determined.

Von Monakow[1] has found about 100 cases of *motor aphasia* with necropsy, which he thinks will stand examination. He believes there is not a single case which shows that a lesion confined to Broca's area causes *persistent* motor aphasia with agraphia, but there are more than a dozen cases demonstrating that motor aphasia may disappear before death when the lesion is in the anterior Sylvian region. So far he agrees with Marie, viz., that destruction of Broca's area does not produce necessarily in right-handed persons persistent motor aphasia, especially with agraphia. The return of function he does not attribute to compensatory action of the corresponding region in the right cerebral hemisphere. In a very small number of cases it has been demonstrated that a right-handed person may not have temporary motor aphasia from a lesion of Broca's area.

It is important to determine the conditions under which motor aphasia becomes persistent. According to v. Monakow, the lesion in itself, *i. e.*, the disturbance of the nerve fibers and nerve cells, even though it implicates the whole of the Sylvian area and even more, is not sufficient to produce persistent motor aphasia with agraphia. The factors which produce this with such extensive lesions are vascular alterations, compression, meningo-encephalitis, toxic conditions, senility, cerebral atrophy, etc. Protracted motor aphasia with agraphia may occur from a lesion outside of Broca's area, in the corpus striatum and gyri adjoining Broca's area, but the lesion must be in the distribution of the two anterior branches of the Sylvian artery. Destruction of the anterior Sylvian region causes a persistent disturbance of speech not always easy to

[1] Paper read at the Congress in Amsterdam, September, 1907.

demonstrate, consisting of lessened fluency, spasticity of speech muscles, rapid exhaustion in speaking, hesitation, etc. Motor aphasia is explained by von Monakow as a result of what he has called diaschisis.

Some important facts relating to aphasia are discussed by Liepmann.[1] Softening of the brain, as he points out, is seldom confined to one branch of the Sylvian artery, and when the symptoms of motor aphasia occur there are likely to be signs of sensory aphasia. Severe word deafness when the lesion is only left-sided is not usually persistent, and may almost entirely disappear. This is probably because the right hemisphere functionates in place of the left, and not because some other part of the left temporal lobe acquires the word-hearing power, inasmuch as a considerable restitution occurs even when the entire left temporal lobe is destroyed. While a lesion of the left first temporal convolution may not produce persistent word deafness, it interferes very much with the recovery of motor speech if Broca's area be affected, because it disturbs the most important entrance point for the speech function—the word-hearing centre. When there is paraphasia with very slight word deafness, the case is one of sensory aphasia, and the lesion is to be sought in Wernicke's zone, not in Broca's. The diagnosis of motor aphasia should not be made simply because the expressive speech is bad and the understanding of words is only slightly impaired. Destruction of both temporal lobes may cause persistent word dumbness on account of the loss of the sound images. Liepmann has had a case in which extensive lesions of both occipitotemporal lobes produced complete asymbolia and complete motor aphasia, but this was not a case of Broca's aphasia; it was one in which all impulses to Broca's area were prevented.

Dercum[2] has placed himself on record as a supporter of Marie's views on aphasia. He reports a case of right hemiplegia with complete motor aphasia and probably some word deafness. The man was unable to understand what was said to him, or to carry out the simplest instruction unless accompanied by gestures and pantomime. The necropsy revealed an old lesion in the left side of the brain involving the lenticular zone and the inferior longitudinal fasciculus; also a recent and very extensive softening upon the right side in the basal ganglia and internal capsule. The old lesion was the only one of importance as regards the aphasia; and this implicated the lenticular nucleus and the adjacent portion of the internal capsule, and could be traced far back along the inferior longitudinal fasciculus. The third frontal convolution was absolutely intact, as well as its subjacent white matter and the convolutions of the zone of Wernicke and the angular gyrus.

Dercum refers to the importance of the corpus striatum, and mentions that it is a structure persistent throughout all the vertebrate forms, and

[1] Neurologisches Centralblatt, April 1, 1908, p. 290.

[2] Journal of Nervous and Mental Disease, November, 1907, p. 681.

that in lower vertebrates it constitutes all of the cerebrum. Even in birds the pallium, the part corresponding to the cortex of man, is very rudimentary, and the corpus striatum must carry on the cerebral functions. It seems not improbable to him that the parrot talks with his corpus striatum, although of course the speech of the parrot is not comparable with that of man. Dercum leaves no doubt as to his position in the question of aphasia, as he says: "Just in proportion as the substance of the lenticula is destroyed, so must there be an absence of motor speech; just in proportion as the function of the lenticula is deranged, so must there be present an anarthria."

Souques[1] has studied microscopically the brain from a case of total aphasia he reported about a year ago. The lesion was an area of softening in the temporoparietal region, occupying Wernicke's zone, and the left third frontal convolution was intact. Microscopic examination has shown that Broca's zone was not affected. Souques now reports a case of Wernicke's aphasia—word blindness and word deafness, agraphia, jargon aphasia without anarthria—in a right-handed person. Two foci of softening were found in the left cerebral hemisphere, one in the frontal lobe the other in the temporoparietal. The frontal lesion involved Broca's area and the anterior part of the insula, and yet motor aphasia is said to have been absent. It is not stated, however, whether motor aphasia was entirely absent from the beginning of the symptom complex.

Color Aphasia. Disturbances in color sense, complete or partial, as red-green blindness, are well recognized as occurring from lesions of the brain. Wilbrand has described a condition which he calls amnestic color blindness. The disturbance is not in the optic sphere, but in speech. It is a sensory aphasia for names of colors. The patients are unable to name colors shown to them or to identify and select colors mentioned to them. Lewandowsky[2] describes another condition relating to color vision. His patient became suddenly sensory aphasic, but recovered largely from this in about three or four weeks, alexia, however, persisting longer. The sensory aphasia was evidently a distant symptom. Right hemianopsia became hemi-amblyopia, but there was no mind blindness, no failure to recognize objects by sight. He was unable to name test wools or to select wools named to him, or to name the color of a familiar object. All this was not the result of a speech disturbance. He was unable to select the color belonging to a familiar object, like the leaf of a tree, but recognized dark and light in shades. He knew the uses of objects. His intelligence was good.

Lewandowsky attempts to show that the man was not color blind. When he was given a color he was able to match it, or when he selected a color he remembered after half an hour the color he had selected and

[1] Semaine Médicale, December 25, 1907, p. 623.

[2] Berliner klin. Wochenschrift, November 11, 1907, p. 1444.

picked it out from others. The condition is explained by Lewandowsky as a splitting off, as a separation of the color sense from the concepts of forms. The color sense was isolated and could not be associated with light and form sensations. The centre for color sense in the left cerebral hemisphere was supposed to be destroyed, while the corresponding centre in the right hemisphere was intact. The association of the color sense of the left and right halves of the retinæ with the other optic elements was possible in this man only by means of the color centre in the left cerebral hemisphere, but this had been destroyed, so that the association was impossible. The color sense was preserved because of the integrity of the right centre. In all cases of cerebral disturbance of color sense the lesion has been in the left side of the brain.

Arteriosclerosis. Some interesting disturbances of gait due to arteriosclerosis are described by E. W. Taylor.[1] One patient, a woman, eighty-three years of age, after much difficulty, hesitation, and "muscular stammering," was finally able to start the muscular movements necessary to walking, and with much difficulty to take short and uncertain steps, and to progress a short distance. There was neither spasticity nor ataxia. The condition is the same as that described by Charcot as senile trepidant abasia. It has been referred to recently by Joseph Collins. Especially striking in Taylor's cases were the stammering character of the gait, the inability to start, and the ineffectual attempts to make progress. Taylor refers to an important paper on the subject by Petrén. This author concludes that arteriosclerosis lies at the basis of the disorder, although it cannot be said that the disturbance of gait is directly due to the changes in the bloodvessels. It would appear that it is directly produced by a feeling of incapacity superinduced by structural vascular changes. Taylor speaks of this explanation as possibly fanciful, although he accepts it. I think it must appear reasonable to those who have observed these patients. There appears to be in their every action a feeling of uncertainty, a want of self-assurance; and as Taylor remarks, explanation, encouragement, and instruction quickly produce results, and the patients may be induced to walk with comparative ease.

Hemiplegia. An interesting disturbance in hemiplegia has been observed by Lewandowsky.[2] A man became paralyzed on the left side, and it was then found that he was unable to close the eyelids together or separately, and yet the lid muscles were not paralyzed. If an object were brought suddenly near the eyes the lid reflex was preserved. He could not keep the eyes closed after the lids were brought together by someone else. The case was not regarded as hysterical, and the author thinks the preservation of the lid reflex excludes hysteria. He calls the condition apraxia of the lid closure.

[1] Boston Medical and Surgical Journal, 1907, clvii, p. 220.

[2] Berliner klin. Wochenschrift, July 22, 1907, p. 921.

Hemiplegia and the Lenticular Nucleus. The conclusions Mills and Spiller[1] have reached regarding lesions of the lenticular zone are:

1. Lesions restricted to the lenticula apparently do not cause sensory symptoms.

2. Motor symptoms probably result from lesions situated in certain parts of the lenticula; speaking generally, the lenticula may be regarded as a motor organ.

3. Anarthric or dysarthric speech disorders result from lesions of some portion of the left lenticula, which probably contains centres which are concerned with the movements which make speech possible.

4. Destructive lesions of certain portions of the lenticula probably cause a paresis of the limbs or face.

5. The paresis or paralysis caused by destructive lesions of the lenticula differs from that produced by capsule lesions, the impairment of power not being so severe and not being so characteristic in the former as in the latter case.

6. The paresis or paralysis which is caused by lenticular lesions differs from that produced by cortical lesions in that it is less likely to be dissociated; although dissociated lenticular paresis may occur.

7. While the loss of power which results from a destructive lenticular lesion is permanent, it is usually not intense.

8. Persistent true motor aphasia, as this form of speech disorder is generally understood, is not caused by a lesion restricted to the lenticula, no matter what its size or destructiveness.

9. The insula, cortex, and subcortex play an important part in speech phenomena, one entirely different from that played by the lenticula and the internal capsule.

10. The insula is a part of the cortical motor centre for speech, Broca's convolution probably forming with the insula the entire cortical motor centre for speech.

11. Motor aphasia may be present without a lesion of the left third frontal convolution.

12. The lenticula forms too large a portion of the cerebral hemisphere to be regarded merely as a vestigial organ.

As regards the functions of the corpus striatum, Dana[2] remarks that he has the notes of 4 cases of hemorrhage or softening of this structure, which are important chiefly because of the rather negative evidence of localization which they furnish. It might be inferred that lesions of this region produce a profounder effect upon the strength and vitality of the patient than would be expected from such comparatively slight lesions, and that at times there are disorders of the motility, such

[1] Journal of Nervous and Mental Disease, September and October, 1907.

[2] Ibid., February, 1908, p. 65.

as rigidity and spasm, which are greater than would be expected from the character and size of the lesion.

Dana refers also to the interesting fact that a very common, if not almost universal, effect of *sewer gas poisoning*, is a softening of both lenticular nuclei. This may happen if the patient has been unconscious from the effect of the gas more than twenty-four hours. Dana proposes that the functions of the lenticular nuclei should be studied in persons who have been poisoned in this way. Kolisko has demonstrated a special artery given off from the anterior cerebral near the communicating branch. This artery is usually single, but sometimes double. It supplies the caudate nucleus, part of the anterior portion of the internal capsule, and part of the outer portion of the lenticular nucleus. The blood within it flows rather against the normal current, and the pressure in this artery easily becomes relatively less than that of the other vessels, and when the general pressure is very low, as in gas poisoning, a tendency to stasis and thrombosis occurs. Kolisko states that it has as much right to the name of "the artery of cerebral thrombosis" as the branch from the middle cerebral has to the name of the "artery of cerebral hemorrhage."

Dana further remarks that the study of the reported cases of lenticular lesions from gas poisoning shows that with the involvement of this region there often occur vasomotor symptoms, edema, and gangrene of the skin. When the patient is unconscious after gas poisoning, and vasomotor and trophic disturbances are present, a diagnosis of lenticular lesion may be made; Kolisko did make such a diagnosis verified by necropsy. Dana's investigations as to the late symptoms of gas poisoning have not been very successful. He believes the corpus striatum does not have any independent or specific motor function. It probably has some supplementary motor function, and especially in connection with articulation. It may have some control over the bladder, and some supplementary and associative psychic function, so that lesions of it affect memory or initiative.

Infantile Cerebral Palsy. Rarely is the opportunity given to determine the cause in the acute stage of cerebral paralysis of childhood. Late in life porencephaly, cysts, and areas of sclerosis are found, but an examination, such as that reported by Hochhaus,[1] is of great value, as it throws light upon the etiology. The symptoms in his case developed after measles, and were convulsions with other signs of cerebral disturbance and hemiplegia. Death occurred from bronchopneumonia. The findings were edema of the pia and a distinct but not very intense meningo-encephalitis of the left central convolutions. An inflammatory cause was, therefore, clearly demonstrated, but the lesions did not seem sufficient to explain the symptoms. It is possible that intoxication assisted

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiv, Nrs. 3 und 4, p. 190.

in producing the symptoms, or that the brain of the young child is more susceptible to slight alterations.

Hereditary Cerebellar Ataxia. As a contribution to familial degeneration of the cerebellum, Gordon Holmes[1] gives the history of a family with eight members, of whom four were afflicted with the same symptoms. In each they began between thirty-three and forty years of age and progressed slowly until death, which resulted from an intercurrent affection at an advanced age. The first and most prominent symptom was a staggering gait from incoördination of the lower limbs; the next symptom was irregularity in the movements of the upper limbs; and later articulation was affected, becoming hesitating or scanning and explosive. Tremor of the head and limbs occurred in all the cases. Nystagmus or nystagmoid jerkings of the eyes on movement was observed in three cases. There was no defect of vision or of hearing, and no motor paralysis or sensory disturbance. The tendon reflexes were unaffected or slightly exaggerated.

In one case with necropsy a degeneration of the cerebellum was found. The disease was limited to this organ, as the inferior olives were the only other part of the nervous system in which pathological changes were detected, and these were secondary. The disease was regarded as a primary and progressive degeneration of the cerebellar cortex.

Paresis. There is much reason to believe that paresis now appears in a form somewhat different from that supposed to be its manifestation some years back. Clark and Atwood[2] discuss this subject, quote the opinions of several writers, and give the results of their analyses of 3000 cases of paresis, covering the period of the last three decades. Only male cases were considered; all the cases were in asylums; the histories were complete; and the diagnosis was confirmed by death in the majority of instances. The gradual increase of the simple dementing form during the last few years they believe shows that some cases of cerebral syphilis are included. They state that many simple, dementing paretics of earlier years were embraced in the classification of terminal dementia, and many cases of acute melancholia terminating in dementia should have been classed as the depressive type of paresis. They have found, as others have done, that megalomania is not so pronounced as it was in previous years, and when present is not so likely to reach great extremes. The depressed type of paresis also has steadily decreased in frequency, while the simple dementing form has gained in frequency. Because of more careful observation, paresis has been recognized in younger persons than formerly, more cases occur between twenty and thirty, and fewer over the age of fifty. From their study they conclude that paresis is essentially a disease in which the grandiose type predominates in about 70 per cent. of all cases, the dementing form occurs

[1] Brain, vol. xxx, 1907, p. 466.

[2] Journal of Nervous and Mental Disease, September, 1907, p. 553.

next in frequency in 20 per cent., while the depressive form is found in about 10 per cent.

Davids,[1] in a study of 26 cases of paresis, has not found any disturbances of the lids and external ocular muscles. The conjunctival reflex was diminished in a few cases, the corneal reflex only in 1. The light reaction was disturbed in 92.30 per cent. of his cases. Inequality of the pupils was found in 84.61 per cent., and the sign became more pronounced as the disease progressed. The accommodation reflex was disturbed in 57.69 per cent. of the cases, and varied from time to time. Irregularity of the pupil was present in 46.15 per cent. Cloudiness of the papilla and retina was found in 15.03 per cent., but only in 23 per cent. were changes in the eye-grounds detected. Vision, the color sense, and accommodation, he finds, are usually normal in paretics until death.

Fever in Paresis. Pappenheim[2] remarks that rises of temperature occur occasionally in paretic dementia, and are associated with an increase of the polynuclear cells in the blood and cerebrospinal fluid. The increase in number of these cells occurs also in the convulsive attacks, cerebral paralysis, and periods of excitement common in this disease. These phenomena are supposed to be brought about by an increase in the quantity of the toxin of paretic dementia. He refers to similar cellular findings in the cerebrospinal fluid observed by Villaret and Tixier in tabes.

Cerebral Localization. In 1899 it occurred to me[3] that the degeneration of amyotrophic lateral sclerosis, being essentially confined to the motor system, might be employed to determine the extent of the motor cortex in those cases of this disease in which the cortex was implicated and a report was made by me on this subject at that time. I found that the postcentral convolution was degenerated by the method of Marchi, but much less so than the precentral convolution ; and, therefore, I concluded that the former convolution is part of the motor area. Its importance is probably much less than that of the precentral convolution. This was before Grünbaum and Sherrington reported their work, as a result of which they limited the motor region to the part of the brain in front of the Rolandic fissure. Campbell later studied 2 cases of amyotrophic lateral sclerosis, and found the postcentral convolution intact. Rossi and Roussy[4] now report 3 cases, in 2 of which they found this convolution slightly affected by the Marchi method, and consequently they grant a slight participation by the postcentral convolution in the motor zone.

Pseudobulbar Palsy. It has been very doubtful whether a unilateral lesion of the brain could cause the symptoms of pseudobulbar palsy,

[1] Monatsschrift f. Psychiatrie und Neurologie, vol. xxiii, Ergänzungsheft, p. 1.
[2] Ibid., June, 1907, p. 536.
[3] Journal of Nervous and Mental Disease, 1900, p. 165.
[4] Revue Neurologique, August 15, 1907, p. 785.

but a case which seems to show that this is possible has been reported recently by Rosenblath.[1] The lesion, an area of softening, was confined to the left cerebral hemisphere, and implicated the central convolutions, the posterior portions of the first, second, and third frontal convolutions, the anterior part of the island of Reil, and the putamen. The objection may be made that another lesion, possibly very small, escaped detection; but to this the author replies that the greater part of the brain was examined microscopically, and the pons and medulla oblongata were studied in an unbroken series of sections. He refers to a few cases of pseudobulbar palsy from a unilateral lesion. While we must acknowledge the possibility of this symptom complex occurring from a unilateral lesion, I may here state that I have frequently observed areas of softening no larger than the head of an ordinary pin, and that such areas readily escape detection, and may produce important symptoms if situated in certain regions of the brain.

Pseudobulbar palsy may be caused by disseminated encephalitis, as in a case reported by Pfannkuch,[2] and then it may occur in a young person. In Pfannkuch's case it followed endocarditis. An abscess of the pons and numerous non-purulent foci of the brain were found.

Meningitis. By *traumatic late meningitis* Kurt Mendel[3] understands a condition in which the wound has been healed and the consequences of the injury apparently have disappeared, but meningitis develops a considerable time after the trauma. Such a meningitis may occur when meningeal hemorrhage irritates the meninges and causes inflammation, especially when alcoholism or syphilis is present; when a fissure of the skull exists from trauma without external wound, and microörganisms penetrate the skull; when a foreign body has entered the cranial cavity and causes a meningitis; or when the meninges are made a locus minoris resistentiæ by the trauma and the microörganisms enter the brain by way of the blood or lymph vessels. Trauma also, in his opinion, may cause a serous meningitis.

Stereognosis and Symbolia. Stereognosis has meant for so long a time the ability to recognize objects by contact without the use of vision, that it comes a little hard at first to follow the suggestion of Prince[4] and a few others to apply it to the perception of form alone, in three dimensions. As Prince says, it is a complex conception, not a sense, but is far less complex than the notion of the nature of an object; and yet he in one place, in his carefully prepared paper, falls into the use of the term stereognostic sense. It is unquestionably true that the intellectual notion of an object depends upon the integrity of the subsidiary sense perceptions, and as in every case where sensibility has been thoroughly tested in all its

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 3 und 4, p. 195.

[2] Ibid., p. 210.

[3] Monatsschrift f. Psychiatrie und Neurologie, October 1907, p. 373.

[4] Journal of Nervous and Mental Disease, January, 1908, p. 12.

forms, and where there has been loss or impairment of the notion of objects, there has been also more or less impairment of the subsidiary sense impressions, the loss of the notion can be equally well interpreted as the result of insufficient information from the sensory loss. It seems to me true also that all that the clinico-pathological evidence justifies is the localization of the subsidiary sense impressions.

Prince seems to accept Claparède's use of terms, according to which agnosia includes the inability to recognize the form of an object in three dimensions (astereognosis) and the nature of the object (asymbolia). A person may thus be unable to determine the shape and dimensions of an object by touch (astereognosis), or this power may be preserved when he is unable to recognize the object and its uses (asymbolia).

Prince points out that the only proper way to test the recognition of form and objects with the toes is to have the person grasp the object with the toes and roll it against the floor. He alludes to the fact that stereognostic perception is employed by me without definition. The term, however, had its origin in Dejerine's writings, and is generally recognized as what Prince calls symbolia.

Stereognosis and symbolia are intellectual processes, I fully acknowledge, but it is questionable whether intellectual judgments are not localizable. I have not been able to accept the teaching that a stereognostic centre exists apart from the sensory cortical area, any more than does Prince. We have sufficient evidence to warrant the statement that a lesion of the parietal lobe may cause disturbance of certain forms of sensation, that secondary to these sensory losses an impairment of stereognosis and symbolia occurs, therefore, that these intellectual processes depend on the integrity of the parietal lobe, which in this sense is a centre. We locate vision in the occipital lobe, and yet all vision is more or less an intellectual process. We do not see objects only in one plane. Nor can I see why we should drop the terms tactile asymbolia and tactile astereognosis if we retain them as symbols of complex tactual defects. We may, with propriety, coin terms to define faulty judgments in other sensory fields. We do not commonly speak of visual asymbolia when vision is impaired so that objects are not recognized although seen, but there is no good reason why we should not do so, and the term then would correspond to what we now designate as mind blindness.

Prince's paper is very logical and exceedingly interesting, and on a subject that is attracting wide attention.

Many doubt the existence of pure astereognosis (tastlahmung), *i. e.*, inability to recognize objects by contact without any sensory disturbances, and until the publication of such a case recently by Kutner[1] there was no clinical evidence of this condition. His patient showed astereognosis

[1] Monatsschrift f. Psychiatrie und Neurologie, March, 1907.

in both hands, but in the left hand slight disturbance of deep sensation was present, while in the right hand sensation was intact. The patient could describe the form of certain objects with his right hand, and could recognize some of these objects, such as those that could be recognized by simple forms.

DISEASES OF THE SPINAL CORD.

Tabes. A case of *unilateral rigidity of the pupil* to light with intense myosis is reported by Levinsohn,[1] and the statement is made by him that such cases are very rare. The condition is usually in association with dilatation of the pupil.

The significance of *reflex rigidity of the pupil* has been differently estimated. Babinski and some other French writers say it is always or almost always a sign of syphilis, and Möbius regarded it as positively indicative of tabes. Erb[2] attempts to throw light on this question. He reports one case in which, during six years at least, and probably during more than eleven years, reflex rigidity of the pupil was the only sign of tabes, but later the diagnosis of tabes became positive. In another case it preceded all other signs of tabes many years; in still another, myosis preceded fifteen to twenty years the other signs. He reports still other cases, all syphilitic, which show that myosis, difference in size of the pupils of unknown origin, or rigidity of the pupil may for a long period be the only sign of tabes. In other similar cases distinct signs of tabes had not developed after many years.

Lymphocytosis of the cerebrospinal fluid occurs in tabes and also in multiple sclerosis, herpes zoster and tuberculosis; but these can be distinguished clinically from syphilis. Lymphocytosis does not occur in every syphilitic person. Only certain forms of syphilis cause lymphocytosis and tabes or paretic dementia; therefore, lymphocytosis is a very important sign of tabes in a doubtful case.

Erb has examined 120 to 140 reported cases of tabes, and in 25 of these the iridic reflex was preserved, in 20 cases on both sides, and in 5 of these myosis was pronounced.

He thinks the specific serodiagnostic reaction to syphilis is full of promise. The method has not been fully elaborated. In the great majority of cases of paresis examined the reaction has been positive, although in most of these the syphilis was not otherwise recognized.

Benign Tabes. In illustration of the statement that tabes now assumes often a benign character, Oppenheim[3] refers to a case in which he made the diagnosis of incipient tabes in a man seventy years of age,

[1] Berliner klin. Wochenschrift, November 18, 1907, p. 1492.

[2] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nos. 5 und 6, p. 425.

[3] Ibid., vol. xxxiv, No. 1, p. 61.

and on questioning the patient learned that the same diagnosis had been made forty years previously by Griesinger, Hitzig, and Westphal. In another case of initial tabes the patient stated the diagnosis of tabes had been made thirty-five years previously. Oppenheim says he has the records of many similar cases, and that often patients come to him with neurasthenia or hysteria who, in reality, are afflicted with an early form of tabes.

Waterman[1] warns against the use of mercury in tabes when optic atrophy exists, and asserts that in most cases in which it is employed sight previously impaired is soon completely lost. Silex and others have made the same observation. The various preparations of iodide also may be injurious to sight in partial tabetic optic atrophy. Waterman has experimented with atoxyl, and his results are discouraging to the use of this drug.

Bulbar Palsy with Tabes. Bulbar palsy has occurred in association with tabes in a few instances, but with the exception of the cases of Charcot and Pfeifer the tabetic symptoms have appeared first. In Charcot's case bulbar symptoms, both motor and sensory, preceded by a few months the tabetic, whereas in Pfeifer's case they preceded them by a period of three years. Pfeifer[2] has collected the reports of 6 cases of tabes with bulbar symptoms in the literature, but he has overlooked the case of Cohen and Spiller, which was with necropsy. Only 1 other case (Oppenheim and Grabower) was with necropsy. Pfeifer's own case is most striking in that all the cerebral nerves except the olfactory and the trochlear were affected, and disturbance of taste, unusual in tabes, was present. Pfeifer gives a synopsis of the cranial nerve symptoms as they were observed in 7 cases of tabes with bulbar palsy.

Central Scotoma in Tabes. Central scotoma is regarded as very rare in tabes, and is considered by many as a complication. Albert Knapp[3] has observed 2 cases of tabes, in 1 of which relative central scotoma for white and blue, without any peripheral contraction of the visual field, indicated probably tobacco amblyopia. Simple genuine optic atrophy in the other eye was attributed to tabes, so that in the same person two different causes for the changes in the eye-grounds were diagnosticated.

In the other case of tabes the central absolute scotoma in one eye with centric limitation of each visual field was attributed to tabes. The unilaterality of the central scotoma was regarded as contrary to retrobulbar neuritis of toxic origin, as in this affection the diminution of vision is almost always bilateral. In the other eye relative scotoma in the lower half of the visual field was found.

[1] Berliner klin. Wochenschrift, September 2, 1907, p. 1107.

[2] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 3 und 4, p. 238.

[3] Monatsschrift f. Psychiatrie und Neurologie, October, 1907.

Arthropathy. Arthritis with resorption more or less complete of the bony extremities in the joint, or with hypertrophy of the synovial sheath, alteration of the cartilages, and intra-articular and peri-articular hyperostoses, is well recognized. Klippel and Monier-Vinard[1] describe a third form, in which the arthropathy is associated with enlargement of the bone, resembling in some degree a malignant tumor of the bone.

Early Tabes. Two cases reported by Strohmayer[2] are of interest in regard to the question of early tabes. They occurred in members of the same family; sisters. The elder, thirty-three years old, presented loss of iridic reflexes to light, with preservation of iridic action in convergence, unequal pupils, and loss of patellar reflexes. The younger had symptoms of tabes at the age of sixteen, viz., vesical disturbance, ataxia, loss of patellar reflexes, and loss of iridic reaction to light and in accommodation with preservation of it in convergence. The sisters belonged to a neuropathic family in which diabetes had occurred in several members.

In almost every case of early tabes hereditary syphilis has been the cause of the disease, but it was not in Strohmayer's cases, and he attributed the tabes to the neuropathic tendency, especially to the diabetes. He points out that in neurotic families tabes and diabetes occur interchangeably.

Syphilitic Origin of Tabes. Mott[3] believes the Spirocheta pallida may vary in its virulence and in its toxicity, and possibly there may be a certain form of virus which produces a special neurotoxin. He refers to several instances where men infected by the same woman later developed a parasyphilitic disease; thus, Brosius reports the occurrence of chancre of the lip in seven glass-blowers, and 5 of these came under observation ten years later; four then had either tabes or general paralysis. Mott has seen syphilitic meningitis occur while the primary sore was yet unhealed. The specific virus of syphilis is probably a protozoön, and some forms of it may be attenuated in their virulence, owing to the passage of the organism through the bodies of certain individuals, while other forms may in like manner be rendered especially virulent. Mott says it is a well-known fact that women infected with syphilis show less frequently residua on the body than do men, and this may be owing to graduated doses of toxins from a syphilized fetus. Children may inherit some degree of immunity from parents who have had syphilis and have been cured. The cerebrospinal fluid of tabes, general paralysis, and syphilitic meningitis invariably contains lymphocytes, often plasma cells, and no polymorphonuclears. This condition, Mott says, practically occurs in no other *chronic affection* of the nervous system, excepting sleeping sickness. Tuberculous meningitis is rapidly fatal, and in this

[1] Revue Neurologique, July 30, 1907, p. 742.

[2] Neurologisches Centralblatt, August 16, 1907, p. 754.

[3] British Medical Journal, January 4, 1908; The Practitioner, January, 1908.

disease polymorphonuclears are mingled with mononuclears. Antisyphilitic bodies have been shown in the serum and cerebrospinal fluid of tabes and general paralysis, and the quantity increases in amount as the disease progresses. The Argyll-Robertson pupil and the irregular pupil, Mott thinks, are met with only in general paralysis, tabes, and syphilis. Either may be the sole sign of syphilis. If 100 persons infected with syphilis are treated with mercury in a thorough manner, a certain number will develop syphilitic disease of the nervous system in spite of thorough treatment, and treatment does not seem to prolong the average interval between infection and the disease of the nervous system. If 100 persons infected with syphilis are not treated at all, or treated imperfectly, only a certain percentage will suffer seriously, but the number of syphilitic and especially late parasyphilitic affections of the nervous system will be greater than in those treated. The reason why early optic atrophy, according to Mott, arrests the development of tabes, is that the loss of sight necessitates mental inactivity, provided the patient does not worry, and suppresses the exciting causes which use up nervous energy and tend to overturn the metabolic equilibrium of the central nervous system. Mott thinks that the frequent indulgence of abnormally strong sexual desires, together with alcoholism, is, after syphilis, the most important factor in the production of tabes and general paralysis. It acts in two ways: (1) directly by exhaustion of neuropotential; and (2) indirectly in the male by the excessive loss to the body of highly phosphorized nucleoproteids contained in the sperm. In Mott's experience, in both tabes and general paralysis the early effects of the syphilitic poison have usually been mild and often unobserved and therefore untreated.

Tabes with Syringomyelia. A few cases of tabes with syringomyelia in the same person are reported, but, with two exceptions, they are all by German authors. A case observed and recorded by me[1] is the first in English or American literature, and the diagnosis I made during the life of the patient. Several writers have held that the association of the two processes is not merely a coincidence, but that one stands to the other in the relation of cause and effect; others have expressed themselves guardedly. It should be remembered that if one of these processes is in causal relation to the other, the simultaneous occurrence of the two disorders should be far more frequent than the few reported cases indicate. In several of these cases the degeneration of the posterior columns has been of the variety known as syphilitic tabes, with thickening of the bloodvessels of the cord and round-cell infiltration of the pia. Much has been written about this form of tabes, and it was the form occurring in my case. In my paper references with short descriptions are given of all the reported cases except one that

[1] Journal of Medical Research, March, 1908, p. 149.

appeared after my paper was written. I cannot determine any causal relation of one process to the other, but look upon their occurrence in the same individual as a mere coincidence. There is, of course, no reason why a person affected with tabes should be exempt from syringomyelia.

Acute Ataxia. Under this name Bregman[1] refers to certain disorders in which ataxia is the chief symptom, although the cases may differ from one another greatly in other respects. The lesion may be either in the peripheral nerves or central nervous system. Acute ataxia has occurred in multiple neuritis, or with vascular lesions or encephalitis of the cerebellum or cerebrum. After referring to a number of cases, Bregman reports two clinical cases of acute ataxia. The symptoms in one were: static ataxia, with tendency to fall toward the left; ataxia of the limbs in movement, especially on the left side; explosive speech; nystagmoid jerkings of the eyeballs in extreme lateral movements, especially toward the left; and gangrene of the right hand. Motor power was preserved and disturbances of sensations, swallowing, or micturition were not present. The symptoms developed suddenly after a short "insult," so-called by German writers, and the lesion was supposed to be in the cerebellum, and on the left side. In the second case the symptoms were: ataxia of the upper limbs on movement; transitory static ataxia; transitory paralysis of the upper limbs; exaggeration of tendon reflexes in all the limbs; inconstant Babinski sign; intense disturbance of the senses of position and movement in the upper limbs; slight diminution of tactile sensation in the fingers; and slight tenderness to pressure over the peripheral nerves and muscles. These symptoms also began suddenly with an insult (apoplectiform attack). The lesion was supposed to be in the peripheral nerves.

Disseminated Sclerosis. In the first edition of his text-book, Oppenheim[2] was unable to refer to a single case of his own of multiple sclerosis with recovery. In the second edition he spoke of one case, and in the fourth edition of three cases with recovery. Remissions in this disease are well recognized.

Amyotrophic Lateral Sclerosis. It has not been customary to regard lead as a cause of this disease, but there is nothing unreasonable in so doing. S. A. K. Wilson[3] remarks that during the last two years more than one case of lead palsy has come under his notice, in which the amyotrophy has steadily progressed in spite of treatment, and at later stages signs pointing unmistakably to a sclerosis of the pyramidal tracts have appeared, so that the condition is finally indistinguishable from what is known clinically as amyotrophic lateral sclerosis. He does not assert that because the symptoms are the same as those of this disease the

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 5 und 6, p. 409.

[2] Ibid., vol. xxxiv, No. 1, p. 61.

[3] Review of Neurology and Psychiatry, June, 1907, p. 441.

pathology must likewise be the same, but he does assume that as a result of lead a structural alteration is produced in both upper and lower neurones, revealing itself in a combination of lateral sclerosis with muscular atrophy. He reports 4 cases, in all of which the onset was with double wrist-drop, the wasting was of irregular distribution and progressive, affecting flexors as well as extensors, but respecting the small muscles of the hands at the commencement at least, and one of the cases did not show any wasting of the small hand muscles at the time the report was made. The amyotrophy was associated with cramps in the limbs, fibrillation in the diseased muscles, sometimes with involuntary spasmodic movements, and with weakness proportionate to the wasting. In 2 cases the symptoms indicated implication of the medulla oblongata. In all the cases the deep reflexes were exaggerated in the legs, and in some also in the arms; in 3 cases there was a double extensor response (Babinski), in 2 ankle clonus, and in 3 a certain amount of spasticity in the lower extremities. The electrical excitation of the muscles was diminished, but there was no reaction of degeneration. Sensory impairment was not present in any of the cases, but lancinating pains occurred in 1 case. This condition from lead seems to differ from amyotrophic lateral sclerosis only in the exemption at first of the small muscles of the hand, but in 3 cases these muscles later became affected. I have known the small hand muscles to escape at first in amyotrophic lateral sclerosis. As yet no necropsies have been obtained in the form of the disease caused by lead.

The first recognition of *lead* as a cause of disease of the central motor neurones seems to have been by Putnam twenty years ago, as Wilson points out. He remarks also that in the majority of lead cases more or less painful cramps occur in the muscles, and he has frequently observed painful cramps in amyotrophic lateral sclerosis; further, that according to the specificity of the toxic agent a sensory or a motor neuronitis may result, or a mixed neuronitis; and this neuronitis may have a greater incidence on the upper or lower path.

In one of Wilson's cases Argyll-Robertson pupil occurred on both sides, but this sign, according to the French school, cannot be regarded as pathognomonic of syphilis, and Wilson says he has seen it in amyotrophic lateral sclerosis, and he refers to 2 other cases in which it was present apart from any question of syphilis.

The commencement of amyotrophic lateral sclerosis is usually between the ages of thirty and fifty years, *i. e.*, about middle life. Some cases are known in which the first symptoms have appeared later in life, between fifty and sixty years, and now Rossi and Roussy[1] report 2 cases, in 1 of which the disease began at the age of seventy-one years, and in the other at the age of seventy-three years. They have been able to find

[1] Revue Neurologique, July 30, 1907, p. 764.

only 1 case in literature (Probst) in which the commencement was after the seventieth year of life.

Poliomyelitis. The paper by Harbitz and Scheel[1] on poliomyelitis is a valuable one. They have examined necropsy material from 19 cases. The nervous system alone was affected. Their investigations have shown, in a severe case of poliomyelitis, a diffuse inflammation of the entire cord and pia, of the entire medulla oblongata and pons, of the basal ganglia, and often also of the cortex of the brain to a greater or less extent, always in connection with similar inflammation in the pia. Even the mild cases are much more extensive than the symptoms indicate. The inflammation extends far beyond the gray matter of the cord, and this I with other observers have also noticed. The cord and medulla oblongata are infected from the meninges along the vessels, and in a great many places simultaneously; and the appearance of the paralysis in a certain order they regard as accidental.

The symptoms may indicate a predominance of the lesions in the medulla oblongata. There is definite relation between myelitis and poliomyelitis, and between encephalitis and poliomyelitis, but probably not between poliomyelitis and polyneuritis. These authors find little evidence of a relationship between epidemic cerebrospinal meningitis and poliomyelitis. Geirsvold's microörganism was present only in 3 of their cases. They believe the disease is due to a specific virus, and that the organism is in the nervous system itself, in the meninges, cerebrospinal fluid, and probably also in the nervous tissues. The infection probably starts from the digestive tract, and the nervous system probably becomes infected by the lymph stream along vessels and nerve trunks, or more likely by way of the blood.

Cerebral Palsy Associated with Poliomyelitis. The association of cerebral palsy with spinal palsy in the same person would seem to indicate that the two processes are related. In a case examined by Rossi[2] convulsions at the age of six months were followed by paraplegia, which examination at the age of thirty years showed to be of different type in the two lower limbs. The right presented the typical form of infantile spastic paralysis, the left that of spinal paralysis. Bilateral symmetrical cerebral softening was found in the first frontal convolutions and paracentral lobules, and a typical focus of old poliomyelitis was seen in the left side of the lumbar and upper sacral regions. The Babinski sign, which was present on each side, has been explained when occurring in poliomyelitis as the result of involvement of the lateral column or of integrity of the long extensor of the great toe.

There is much reason to believe that poliomyelitis is part of a general affection of the central nervous system. I have seen a case in which the first symptoms indicated infection of the lower part of the cord, and

[1] Journal of the American Medical Association, October 26, 1907, p. 1420.

[2] Nouvelle Iconographie de la Salpêtrière, 1907, No. 2, p. 122.

within a week or two the process extended to the medulla oblongata and pons with little or no implication of the upper limbs. Marie is doubtless right in believing that the disease is not confined strictly to the gray matter either in the cord or in the brain, although Strümpell held this opinion.

Subacute Anterior Poliomyelitis. The conclusions to which Medea[1] comes regarding his study of the subacute anterior poliomyelitis of adults is that the disease has a clinical form, is rare, but should be recognized. It has a distinct anatomical foundation, and resembles in its findings those of acute poliomyelitis, as described by some recent writers. Sensory disturbances may occur in rare and atypical cases, and may be due to changes in the peripheral nerves, or to slight changes in the posterior columns of the cord. In some cases of subacute anterior poliomyelitis more or less positive alteration of the anterolateral columns is found, and is attributable probably to the changes in the anterior horns. The typical form of amyotrophic lateral sclerosis and the typical subacute anterior poliomyelitis are very different in their clinical and pathological manifestations, but occasionally atypical types of these diseases may make the resemblance between the two processes, both clinically and pathologically, very striking.

Myelitis. Labor in Spinal Cord Lesions. The effect of a destructive lesion of the lower part of the spinal cord on labor is interestingly depicted by E. W. Taylor.[2] A woman toward the end of her first pregnancy had beginning paralysis of the lower limbs, together with sensory and sphincteric disorder, which within a few days developed into a complete motor and sensory paraplegia extending to a point about midway between the umbilicus and the pubes. The clinical signs indicated a complete transverse lesion of the spinal cord involving the entire lumbar region. On routine examination the physician found definite uterine contractions as felt through the abdominal wall. The woman was conscious of these contractions, but made no complaint of pain, and seemed to have none. The condition did not seem to be urgent, but when the physician returned three hours later the head was on the perineum, labor having been accomplished to this point without pain and without the consciousness of the patient. The uterine contractions had been adequate, but lacking in force. The abdominal muscles took no part in the process. Delivery was completed by forceps. The perineum was torn and was sewed without pain.

The case was especially interesting because of the absence of pain, the absence of any distinctive use of the auxiliary muscles during the second stage, and the satisfactorily firm contractions of the uterus after delivery. The necropsy showed a completely destructive sar-

[1] Monatsschrift f. Psychiatrie und Neurologie, April, 1908, p. 341.

[2] Boston Medical and Surgical Journal, 1907, clvii, 14.

comatous tumor of the whole lumbar and sacral region of the cord, extending upward on its dorsal surface into the cervical region.

Taylor, from his investigations, concludes that the pain of labor is to be regarded as of physiological importance in regulating the action of the accessory abdominal muscles in birth; it is not essential to effective contractions of the uterus.

Experiments have shown, as Taylor says, the independence of the uterus from its central connections. Resection of the lumbothoracic cord has not interfered with the birth of normal pups, and destruction of the lumbar cord has not prevented normal birth. Uterine contractions will take place when the uterus is separated from spinal or sympathetic tracts. In one case the pregnant uterus was removed, and half an hour later the size of the os increased, and at the end of two hours a fetus, estimated at about the third month, was born. During this period slow contractions of the uterine muscle were observed. This case shows, as Taylor says, that uterine contractions are possible after complete separation from the central nervous mechanism, but the contractions seem to be less forcible than when the entire nervous system is intact.

Syringomyelia. Occasionally certain of the symptoms of *myotonia* are found associated with syringomyelia, and the name myotonia syringomyelia has been employed to designate this condition. A case reported by Rindfleisch[1] seems to show that the two diseases may exist in the same person, and that it is not always merely syringomyelia with myotonic symptoms.

Tumor of the Spinal Cord. In an important case of tumor of the cord reported by Oppenheim and Borchardt[2] the symptoms of pressure were merely from the upper end of the tumor, and yet the tumor extended from the middle of the lumbar region below the end of the cord. The symptoms indicated a lesion at the third and fourth lumbar segments, and among these was spastic paralysis of the left lower limb. Oppenheim thinks the smaller size of the conus explains the absence of compression from the lower part of the tumor. The upper end of the tumor may have been the older part, and may, therefore, have caused compression longer. The tumor was unilateral, and yet the sensory disturbances of the lower limbs were bilateral. The diagnosis between extramedullary and intramedullary tumor was extremely difficult; indeed, from the description it seems to have been impossible. Oppenheim recommends that operation shall be performed in these doubtful cases.

Nine cases of *tumor of the cauda equina or lower vertebræ* have been reported by me;[3] 7 of these were with necropsy, and 3 with operation. I must refer the reader interested in this subject to the original paper,

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 3 und 4, p. 171.

[2] Berliner klin. Wochenschrift, September 9, 1907, p. 1131.

[3] American Journal of the Medical Sciences, March, 1908, p. 365.

as it would be impossible to give here even a *resume* of the discussion regarding diagnosis and treatment. Operations in such cases have not been very successful. In my cases where the tumors could be examined they were all of such a character that complete removal would have been impossible, and this seems to have been true of most, if not of all, recorded cases. The well-defined almond-shaped fibromata or fibrosarcomata occurring frequently at higher levels of the cord are much less likely to develop in the region of the cauda equina. Tumors in this location are frequently sarcomata, and often infiltrate about the roots of the cauda equina or implicate the surrounding bone.

Spinal Cyst. A very interesting case of spinal cyst has been studied by W. C. Krauss.[1] The symptoms began with a rather sudden onset of pain and weakness of the muscles of the leg. The pain was referred to the lower abdomen. Weakness of the lower limbs increased until the patient became bedridden. Girdle pains were not present. The tendon reflexes of the lower limbs were exaggerated. Sensation was impaired in these limbs. Operation was performed by Roswell Park. After separating the muscles and other tissues from the spines and arches of the vertebræ a cavity was found, into which the finger could easily be passed. It was of considerable size and within the vertebræ; it was not lined with membrane, but was everywhere eroded, and rough bone could be felt. The cord could be distinguished at its base, and apparently was affected only by the pressure from the cyst. The exact nature of the lesion was not determined. Some improvement in the patient's condition followed the operation.

Krauss gives an excellent review of the subject of spinal cyst.

Fracture of the Spine. An excellent presentation of the subject of fracture of the spinal vertebræ and a discussion of operation in such cases is given by A. R. Allen.[2] I cannot refer to all the cases nor to all the views of the author, but it may be stated that the paper is conservative and yet not biased. A most striking case is one in which the spinal cord had been grazed by a bullet, the dura being intact and without abrasion. The bullet had lodged in the vertebra and was exerting no pressure whatsoever on the cord. Whatever injury was produced resulted, therefore, from the instantaneous pressure of the bullet in passing, but the spinal cord was greatly damaged at this part. As Allen correctly says: If a fragment of bone has exerted pressure sufficient to cause degeneration, that degeneration will take place and be as immutable one second after the injury as it would be a week later. This case really has the value of an experiment performed on a human being.

Allen presents the history of another case where it was clearly shown that operation may do harm. He is not an enthusiast for operation, and his arguments are strong.

[1] Brain, 1907, vol. xxx, p. 533.

[2] Journal of the American Medical Association, March 21, 1908, p. 941.

In studying the spinal cord of cases of *carcinoma of the vertebræ* in which symptoms of a complete transverse lesion had been present, he[1] found comparatively few swollen axis cylinders and swollen medullary sheaths, and few spaces from which axis cylinders had dropped. The interesting feature of the case was that a spinal cord which appeared so little altered even microscopically, had ceased to be a conducting mechanism. He assumes, and rightly, that had this condition been caused by a fracture dislocation instead of a rapidly increasing malignant growth, some return of function would have occurred, and would have been ascribed by certain observers to regeneration after complete transverse lesion. It is, as he says, remarkable that the spinal cord can so completely suspend its functions, at the same time presenting so slight evidence of organic change; and this fact should make us careful in giving a very bad prognosis as to return of function in cases which have presented even for some months symptoms of complete transverse lesion.

Acute Paraplegia following Injections Preventive of Hydrophobia. Paralysis of the lower limbs following the Pasteur treatment for hydrophobia, such as E. Müller[2] has observed, is very uncommon, and its cause is uncertain. The symptoms resemble those of Landry's paralysis except in the sensory and vesical disturbances, and are suggestive of disseminated myelitis. The prognosis is good and the condition is rare, and, therefore, the pathogenesis is uncertain. The diagnosis of hysteria cannot be entertained, nor can the theory be accepted that the paralysis is caused by the hydrophobia from the animal giving the bite, but is modified by the injections. In some of the cases in which it occurred the animal from which the bite was received probably did not have hydrophobia. The injections seem to be the direct cause, and while this serious complication of paralysis is deplorable, it must be remembered that the mortality in persons from the bite of a dog certainly affected with hydrophobia is only 1 per cent. after the Pasteur treatment, and is 40 or 50 per cent. or more without this treatment. The paraplegia usually begins one to two weeks after the first injection, is associated with severe bladder and rectal disturbance and paresthesia and pain in the lower limbs, and is ushered in with moderate fever, headache, etc. The tendon reflexes may disappear, but may even be exaggerated. Objective disturbance of sensation may be observed, and the upper limbs and later the bulbar muscles may become paralyzed. Recovery usually occurs, although it may be slow. Tonic convulsions are absent. Little can be done in treatment, but the injections should be discontinued.

Spinal Localization. Oppenheim was unable to determine that segments of the abdominal muscles become disordered separately by lesions

[1] American Journal of the Medical Sciences, May, 1908, p. 735.

[2] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiv, Nrs. 3 und 4, p. 252.

of the spinal cord, as all the segments of one side in his cases became affected simultaneously. Irritation of a single nerve root caused contraction of all the abdominal muscles on the same side, and from this he concluded that every muscle segment is innervated by every nerve of the lower thoracic region. Salecker[1] combats this opinion from the results obtained by him in 2 cases, and he concludes that not only complete but also partial paralysis of the abdominal muscles occurs from spinal lesions; that the innervation of the abdominal muscles is not multiradicular, but segmental; that the rectus muscle has its nucleus higher than that of the oblique muscles; that the abdominal reflexes correspond in spinal localization to the muscle segments of the same level; and that segmental paralysis of the abdominal muscles in association with disturbance of the abdominal reflexes and of sensation is important in segment diagnosis in the cord.

Lewandowsky has observed that where compression of the thoracic portion of the spinal cord exists irritation of the lower limbs may be felt in the upper limbs. Renner[2] reports a case of compression of this region in which irritation of the lower part of the body was felt in a girdle zone of hyperesthesia about the trunk. Two explanations for this phenomenon are possible: When painful irritation is made in a less sensitive area than one of greater sensitiveness with which it is intimately centrally connected, the sensation may be felt in the latter, according to Head's investigations; or the impulse started in the hypoesthetic region may be conveyed properly to the area of compression in the cord and here be transmitted to the more sensitive fibers from the hyperesthetic region.

DISEASES OF THE NERVES.

Ocular Palsy after Lumbar Puncture. Paralysis of ocular muscles, usually of the external rectus, has been observed after anesthesia produced by lumbar puncture. Ach has reported four cases and collected others from the literature. Wolff[3] considers the explanation of this occurrence as a result of toxic action from the substance injected unwarranted, and he reports a case in which he performed lumbar puncture with the intention of injecting stovain, but did not inject it, as the puncture caused hemorrhage. He used chloroform instead. Abducens paralysis developed suddenly five days after the operation, but almost disappeared after six weeks. The paralysis could not be explained by the escape of a considerable quantity of cerebrospinal fluid, as little was lost. An intradural hematoma, he thinks, may have occurred as a result of injury to a vessel during the puncture, and from this a toxic effect upon the

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiv, Nr. 2, p. 160.
[2] Ibid., Nrs. 3 und 4, p. 210.
[3] Berliner klin. Wochenschrift, October 14, 1907, p. 1305.

abducens may have been produced, especially as five days elapsed before the paralysis occurred.

Sciatica. E. Schlesinger[1] reports great success in the treatment of acute and chronic sciatica by injections of large amounts of normal salt solution cooled to 0° (32° F.). It is not desirable to reach the nerve with the needle. Usually one injection is sufficient. He implies that the same treatment may be useful in the girdle pains of tabes.

Von Bechterew[2] refers to some new signs of sciatica. By Bonnet's sign is meant pain caused by adduction of the affected limb. Montard-Martin's sign is pain in the affected limb produced by flexion of the sound limb at the hip. The pain is usually in the buttock or tuberosity of the ischium. Von Bechterew has not found the sign constant. Kernig's sign he has seen in sciatica, and he believes it is produced reflexly. He states that if the patient while sitting extends the normal lower limb, he will be almost completely unable to extend the affected limb; if he tries to extend the affected limb, he is unable to extend the normal limb at the same time, and yet he can extend either limb separately, although the affected limb only imperfectly. This is very much like the phenomenon described by Grasset in hemiparesis, when the patient is unable to flex both lower limbs at the hip simultaneously.

Muscular Atrophy Caused by Interstitial Hypertrophic Neuritis. An interesting and unusual case of muscular atrophy has been studied by E. Long.[3] During life the case was regarded as one of chronic anterior poliomyelitis. The atrophy began in the extremities of the upper limbs and extended slowly toward the shoulders. The right hand was not affected until seven or eight years after the left hand had shown the wasting. Fibrillary tremors occurred in the atrophying muscles. The right upper limb was not as much involved as the left. The progression of the symptoms ceased after twelve years. The trunk, face, and lower limbs were not implicated. Pain was experienced during several years in the upper limbs, but objective sensation was unaltered. The spontaneous pains should have made the diagnosis of chronic poliomyelitis doubtful, but they were regarded as rheumatic. The microscopic examination showed that the spinal cord was intact, the nerve fibers were diminished in number in the peripheral nerves, and the interstitial tissue was increased in amount. The alterations were less intense in the peripheral ends of the nerves and in the anterior roots.

The disease resembled the interstitial, hypertrophic neuritis of Dejerine and Sottas, but it lacked certain symptoms which make that disorder so striking and remind us of tabes, such as the Argyll-Robertson pupil and ataxia. It is not surprising that the atrophy was supposed to be spinal in origin, because a certain form of pain is not uncommon in

[1] Deutsche med. Wochenschrift, Nr. 6, 1908, p. 236.
[2] Neurologisches Centralblatt, December 1, 1907.
[3] Nouvelle Iconographie de la Salpêtrière, 1907, No 1

wasting muscles, and may be the result of fatigue; the pain then is not usually sharp but a dull ache.

Partial Palsy of the Oculomotor Nerve. Why is it in peripheral lesions of the oculomotor nerve the external muscles of the eye (third nerve) may be paralyzed while the inner muscles escape? Fuchs[1] attempts to answer this question. In toxic conditions, as tobacco or alcohol poisoning, or even from pressure on the optic nerve by a basal tumor or a tumor at the back part of the orbit, central scotoma is not uncommon. It cannot be that the central position of the papillomacular bundle within the optic nerve affords it any protection; indeed, this fasciculus seems more susceptible to injuries. It appears to Fuchs that the escape of the fibers to the ciliary muscle and iris when the oculomotor nerve is paralyzed in its other distribution must indicate that the former fibers possess a certain immunity.

Neuritis and Trauma. In the remarkable series of papers in which Kurt Mendel[2] discusses the influence of trauma on disease of the nervous system he expresses himself regarding neuritis. In his opinion, as in that of many other investigators, an ascending neuritis after trauma is comparatively rare, and when it occurs is the result of a penetration of microörganisms from the wound into the tissues, a septic infection, or else the individual has become predisposed to nervous disease from chronic intoxication, especially alcohol, and the trauma is merely a local exciting cause. He believes that a localized neuritis, not ascending, may occur from trauma without infection or a predisposition on the part of the patient, but is relatively seldom, and more careful examination will usually show in a suspected case that infection or predisposition has really been present. In none of his cases could he detect an extension of the neuritis to the spinal cord, even when the ascending neuritis had lasted a long time. In every case the process was confined to the limb in which it began.

These statements correspond to those of Krehl. Septic infection is necessary for an extension of the process beyond the spinal ganglia. Although Mendel is speaking of traumatic neuritis, he adds that in other forms of neuritis usually the process is confined to the nerves and the spinal cord remains intact. This corresponds to my findings in quite a large number of cases of multiple neuritis, excepting, of course, the cells of the anterior horns, in which the alteration is probably secondary. Clinical findings agree with the experimental in showing the importance of infection for the occurrence of traumatic ascending neuritis.

[1] Obersteiner's Festschrift, vol. i, p. 1.

[2] Monatsschrift f. Psychiatrie und Neurologie, April, 1908, p. 364.

MISCELLANEOUS NERVOUS DISEASES.

Myatonia Congenita. A second case of congenital hypotonia of the muscles, described by Oppenheim, has been reported with necropsy by Baudouin.[1] The first case with necropsy was recorded by me, and in this the muscles were found to be abnormal, but the nervous system showed no marked peculiarities. The condition was, therefore, regarded as an arrest in the development of the muscular system. Baudouin has found similar changes in the muscles, but in addition he believed he could detect signs of arrested development in a scarcity of nerve cells in the anterior horns of the spinal cord, and of the fibers of the motor lumbar roots and of the peripheral nerves. These are findings in which one may easily be deceived, unless they are very pronounced, and it will be interesting to watch for further reports of necropsies in this apparently rare malady.

Myasthenia Gravis. The fact that J. A. Gunn[2] has been able by the administration of yohimbine to produce in the frog symptoms which present a great similarity to those occurring in man in myasthenia gravis is very important, as suggesting that the symptoms of this disease are caused by some toxic substance. Even the electrical reaction of the nerves and muscles in the yohimbinized frog were identical with those which have been found frequently in myasthenia gravis. The symptoms of this disease might readily be caused by some poison, but as yet we have no knowledge as to what this poison is.

Mingazzini[3] has studied a case of myasthenia gravis in which the symptoms followed the injection of stovain into the spinal canal.

Toxemia may cause symptoms resembling very closely those of myasthenia gravis. A recent case of this kind is reported by Gowers.[4] His patient was a man who began to taste all sweet things as salty; this soon disappeared and was followed by a tight feeling in the throat on swallowing. Swallowing became so difficult that only jellies or soups could be taken. Speech became affected, so that when the man began to talk his voice was good and his articulation fair. As he went on speaking his voice became feeble and his articulation imperfect. He seemed to have great difficulty in moving his tongue and lips. Other symptoms of myasthenia gravis were present. Gowers remarks that such symptoms have not been observed from a toxic cause, but his patient had been exposed to the fumes of burned petrol. Distinct improvement was seen in a week after a hypodermic injection of strychnine nitrate gr. $\frac{1}{30}$ had been given twice daily. The subsequent improvement was steady and

[1] Semaine Médicale, May 22, 1907, p. 241.
[2] Review of Neurology and Psychiatry, March, 1908, p. 150.
[3] Revue Neurologique, March 15, 1908, p. 185.
[4] Review of Neurology and Psychiatry, January, 1908.

recovery became complete, but the symptoms returned after the man returned to his work and was exposed to the petrol fumes. The poisoning may have been from imperfect combustion.

It may seem strange that myasthenia gravis should cause a symptom complex resembling *progressive muscular dystrophy.* Grund[1] reports the following case: A boy, aged fifteen years, showed the first symptoms of his disease when nine years old. When he came under observation he presented lordosis of the lumbar region with abnormal prominence of the buttocks, and in walking had marked lateral movements of the lumbar vertebræ; presumably by this is meant that he raised the hips alternately, as in the "duck walk." In rising to a standing position he climbed upon his lower limbs with his hands, as is common in muscular dystrophy. Almost all the muscles of the trunk and limbs were weak, but not atrophied or hypertrophied. The diagnosis of myasthenia gravis was possible because of the abnormal fatigue, the myasthenic reaction, the normal or exaggerated condition of the tendon reflexes, and the absence of localized atrophy common in muscular dystrophy. Grund states that in Oppenheim's statistics, no case of myasthenia gravis without oculobulbar symptoms is mentioned, and yet a certain number, like his own case, exist without these symptoms.

Graves' Disease with Myasthenia Gravis. The combination of these two diseases in the same person is regarded by Rennie[2] as unusual. He has found only the cases of Meyerstein, Loeser (2 cases), and Brissaud and Bauer. He reports an additional case. The important questions in this connection are: Are there two etiological factors? Are the symptoms of Graves' disease due to perverted thyroid function, and the myasthenic symptoms to some hypothetical toxin? or is there but one morbid factor producing all the symptoms? Graves' disease is comparatively common, and is seldom associated with myasthenia gravis, so that it is improbable that the latter depends on perverted thyroid secretion. In myasthenia gravis the disease of the thyroid gland is rare, but Rennie remarks that he observed a case of myasthenia gravis in which the symptoms of this disease developed somewhat rapidly after the administration of large doses of thyroid gland tablets for the purpose of reducing the weight. Rennie concludes that at present we cannot arrive at any definite solution of these questions.

Meralgia Paresthetica. The occurrence of meralgia paresthetica in the distribution of the external cutaneous nerve of the thigh is well known, but another form in which the symptoms are confined to the middle cutaneous is rare, and has been described only a few times. Meralgia differs from neuralgia in that the pain occurs only in walking or standing and not when the patient is at rest, paresthesia is conspicuous, and objective sensation is diminished in the affected territory. In the case

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 1 und 2, p. 14.

[2] Review of Neurology and Psychiatry, April, 1908, p. 229.

reported by Lasarew[1] only the middle cutaneous nerve was affected, whereas, in the 3 previous cases recorded in the literature (Escat, Joncherai, Neisser and Pollack) both the middle and external cutaneous nerves were involved. In Neisser and Pollack's case lymph glands were removed that pressed on the middle cutaneous nerve at Poupart's ligament, and this ligament was incised, as it exerted pressure upon the nerve. The symptoms disappeared in the front of the thigh after the operation, but not until two months later in the lateral portion of the thigh.

Athetosis. Haupt[2] remarks that idiopathic or primary athetosis is relatively rare, especially with necropsy. Lewandowsky has distinguished between double athetosis and similar forms developing after hemiplegia. The former is not merely a posthemiplegic athetosis affecting both sides, or a result of infantile spastic diplegia, but is an independent peculiar disease, whose pathology is not positively determined, but probably consists of bilateral cerebral lesions. Oppenheim also makes this distinction. To speak of primary double idiopathic athetosis, previous diplegic disturbance must be excluded.

The case reported by Haupt is as follows: A child, slightly rachitic but otherwise healthy, at the age of three years had paralysis following diphtheria, which disappeared leaving a left peroneal palsy. Later, mental failure developed slowly to dementia, and weakness became so marked that when the child was six years old it could not walk alone. Gradually the movements of the limbs became ataxic, and spasms and athetosis developed. Death occurred at the age of twelve years. Small, cortical foci were found in the left parietal lobe, and appeared to be the remains of former encephalitis. In the cases in literature the pathological findings Haupt says were slight; in Kurella's case, pachymeningitis and cerebral atrophy; in Dejerine and Sollier's, asymmetry of the brain and left-sided atrophy; in Bourneville and Pillet's 3 cases, no lesions; in Huet's, slight diffuse glia proliferation in the spinal cord; and in Putnam and Osler's 2 cases, abscesses of the temporal lobe with degeneration of a cerebral peduncle, and in one case no lesions.

Chorea. An interesting question has been raised by Ewald and Witte,[3] viz., the relation of chorea to gastro-intestinal disturbances. They cannot assert with certainty that such a relation exists, but they believe that infectious bacterial poisoning or chemical toxic material may, by absorption, cause great disturbance of the central nervous system in a predisposed person. In a case that they studied rapid improvement of the chorea occurred after removal of decomposing material from the gastro-intestinal tract and disinfection of the tract by salicylates, etc. They compare the chorea in their case to the tetany resulting from gastro-intestinal disease.

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiv, Nr. 2, p. 154.

[2] Ibid., vol. xxxiii, Nrs. 5 und 6, p. 464.

[3] Berliner klin. Wochenschrift, January 13, 1908, p. 45.

Facial Palsy, with Chorea of the Opposite Side of the Body. As Gubler's type of paralysis the German writers describe a cross paralysis implicating the face on one side and the limbs on the other; as Weber's type, an implication of the oculomotor supply on one side and of the limbs on the other. The syndrome of Benedikt consists of oculomotor paralysis of one side and hemichorea of the other side of the body. H. Schlesinger[1] now describes a new type in which the facial nerve supply is paralyzed on one side with hemichorea of the opposite half of the body, and this type bears a resemblance to the Gubler's syndrome similar to that of the Benedikt's syndrome to the Weber's syndrome. The condition in Schlesinger's patient lasted only a short time and terminated in recovery. The diagnosis of encephalitis of the pons was made, partly because of optic neuritis, slight elevation of temperature, mild meningeal symptoms, and absence of progression in the development. Schlesinger believed that two lesions must have been present, one involving the facial nucleus or facial tract, and the other the anterior cerebellar peduncle. A necropsy was not obtained in his case. I believe, from my own observations, that progressive development of symptoms may be expected in encephalitis pontis, and therefore the absence of progression hardly seems to me a point either in favor of or against the diagnosis.

Huntington's Chorea. One of the most thorough studies of chronic chorea has been made recently by A. S. Hamilton.[2] His cases number 27, and his experience extends over nine years. He comes to the same conclusion as some other writers, that there is no essential difference between Huntington's chorea and senile chorea. In 16 of his cases there was a clear history of chronic chorea in the ancestry, and in two possibly in the ancestry and certainly in the immediate descendants; 6 had brothers and sisters with the disease. In his cases, therefore, a similar disorder existed in the immediate relatives in twenty-four instances, and in the remaining three the history was lacking. A striking feature was the relative absence of other forms of mental and nervous disorders among the relatives; this is in contrast to the statements of certain writers. The disease he finds affects males a little more frequently than females, and may be transmitted through either sex. Syphilis and alcohol are relatively unimportant. Hamilton's youngest patient was nineteen years old, and she had had the disease two years. In some families there is a tendency for the disease to appear at a progressively earlier age in succeeding generations. This seems to be usual in some other family affections, as I, as well as others, have observed. Senile conditions were common in Hamilton's cases. Sometimes the movements were first noticed in the hands, sometimes in the lower extremities, and sometimes in the face, more frequently in the feet and legs. In 15 cases in which the tendon reflexes were studied an increase was observed in 12.

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxii, Nrs. 4 to 6, p. 301.

[2] American Journal of Insanity, January, 1908.

Muscular tonicity was exaggerated in nearly all the advanced cases examined for it. Impaired sensations to the pricking of a pin seemed to be common. Mental impairment was present in all his cases with one exception, and delusions were frequent.

Torticollis. As the tendency is so strong among certain writers to ascribe spastic torticollis to hysteria, and to treat it by suggestion, it is important to pay attention to disease of the inner ear found as a cause by Curschmann[1] in 3 cases. He recommends that whenever spasmodic torticollis exists the condition of the inner ear should be determined. The person afflicted with disease of the semicircular canals may hold the head in some forced position to overcome the vertigo, and this may terminate in spastic torticollis. Treatment should be directed to the inner ear. The author recommends quinine.

Epilepsy. The production of epilepsy in the human being from *santonin poisoning*, as described by Jelliffe, is extraordinary. It occurred in a child to whom the drug was given for lumbricoid worms. Jelliffe[2] describes the results he obtained by poisoning rabbits with santonin, in which he produced convulsions. The changes in the cortex show marked similarities to those induced by other nerve poisons. Mascroscopically, an intense congestion of the meninges and of all the cerebral vessels occurs. Microscopically, the meninges and vessels are tinged with blood, and minute capillary hemorrhages are common and are widely diffused. The changes in the nerve cells are not specific, and the chromatolysis and nuclear alterations are not as intense as in many other poisonings. The neuroglia is affected. It is probable from these investigations on the lower animals that similar changes occur in man from santonin poisoning.

In 1906 Redlich[3] showed that in about 40 per cent. or more of those afflicted with genuine epilepsy indications of *hemiparesis* are found, especially on the right side. He concluded that these results furnish support for the view that organic changes are present in the brains of epileptics, and especially on one side. He now attempts by the examination of many epileptics to determine what relation left-handedness bears to the disease, and although he avoids figures, he believes that his investigations give evidence sufficient to justify the opinion that left-handedness indicates a mild disturbance of the left cerebral hemisphere. In this way a predisposition to epilepsy is formed, and on this basis infection, intoxication, trauma, recent syphilis, etc., produce the disease.

Hysteria. One of the most important papers on the occurrence of *hysteria in childhood* is by J. J. Thomas.[4] The upper limit of age he has put at fifteen years. Hysteria in children in this country is not

[1] Deutsche Zeitschrift f. Nervenheilkunde, vol. xxxiii, Nrs. 3 und 4, p. 305.

[2] Journal of Nervous and Mental Disease, April, 1908, p. 243.

[3] Archiv f. Psychiatrie, 1908, vol. xliv, Nr. 1, p. 59.

[4] Journal of Nervous and Mental Disease, April, 1908, p. 209.

as frequent as in Europe. Thomas reports 24 cases, 15 in girls and 9 in boys. Trauma was the most frequent exciting cause, direct suggestion played a part in some of the cases, and overstudy was a cause only once. The psychical changes were slight. Thomas finds that the so-called stigmata are rare in children, and what he says is undoubtedly true, viz., that many cases have been reported as hysteria in children which are examples of organic disease. Authors seem to agree that the neurosis is more easily cured in children than in adults.

Retention of urine when caused by hysteria is not usually of long duration, therefore the report of a case of J. Raimist,[1] in which retention persisted one year and ten months is of interest. Faradization of the perineum and suprapubic region restored the function of urination rapidly. The visual fields were much contracted.

Muscular Dystrophy and Typhoid Fever. Typhoid fever has not been recognized generally as a cause of muscular dystrophy, and therefore a paper by Georges Guillain,[2] calling attention to this disease as a cause, is important. He observed a man, forty-five years of age, who had been in good health until he was thirty-nine years old, and had no hereditary tendency to disease. During the convalescence from the fever progressive muscular atrophy developed, progressed slowly, and caused weakness of the upper and lower limbs and of the trunk. Sensation was not affected and the sphincters functionated normally. Neuritis is not very rare after typhoid fever, but it does not develop slowly during four or five years, and it causes some disturbance of sensation both subjectively and objectively. For these reasons Guillain rejects the diagnosis of neuritis in his case. The absence of fibrillary contractions and of the reaction of degeneration leads him to reject a spinal origin for the atrophy. He accepts the diagnosis of myopathy because of the slowly developing atrophy without fibrillary contractions and without reaction of degeneration, because of the absence of all sensory disturbances, because of the patient's gait, his manner of raising himself when lying down (climbing upon his lower limbs), and because of the deformity of the thorax.

Guillain mentions the degenerative muscular changes that occur during the acute stage of typhoid fever, also the hypertrophy of muscles confined to a limb or part of a limb following this disease, non-progressive, and resulting from vascular lesions, especially phlebitis; and this he thinks is probably a true hypertrophy, inasmuch as it is accompanied by increase of motor power. These forms are not slowly progressive, and are therefore different from that observed in Guillain's case and in two others (Friedländer, Josserand), and these three cases seem to be all that have been reported. This post-typhoid myopathy affords evidence

[1] Neurologisches Centralblatt, July 16, 1907, p. 646.
[2] Semaine Médicale, June 12, 1907, p. 277.

that progressive muscular dystrophy is not always a fault of development, but may be an acquired process.

Atypical Forms of Muscular Dystrophy. Two atypical cases of muscular disease are recorded by August Wimmer.[1] The first resembled the myatonia congenita of Oppenheim in congenital flaccid paralysis of the muscles of the limbs and trunk, but was unlike it in the beginning reaction of degeneration and the progression of the disorder. It resembled also the atrophy of Werdnig, except that it was congenital; but finally, Wimmer concludes that in this case there was diminished resistance of the protoneurone, which in some instances may be temporary and reparable (congenital myatonia), in others progressive and fatal (Werdnig-Hoffmann's muscular atrophy).

Another case he reports resembled the Charcot-Marie type of muscular atrophy, except that the muscular weakness was congenital and was associated with imbecility. It resembled also the progressive, interstitial muscular atrophy of Dejerine and Sottas, in the thickening and tenderness of the peripheral nerves, in the ataxia and Romberg's sign.

These two cases, Wimmer thinks, show how difficult it is to maintain sharply defined types of muscular atrophy, as the transitional cases are so numerous

[1] Archiv f. Psychiatrie, vol. xlii, Nr. 3, p. 960.

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